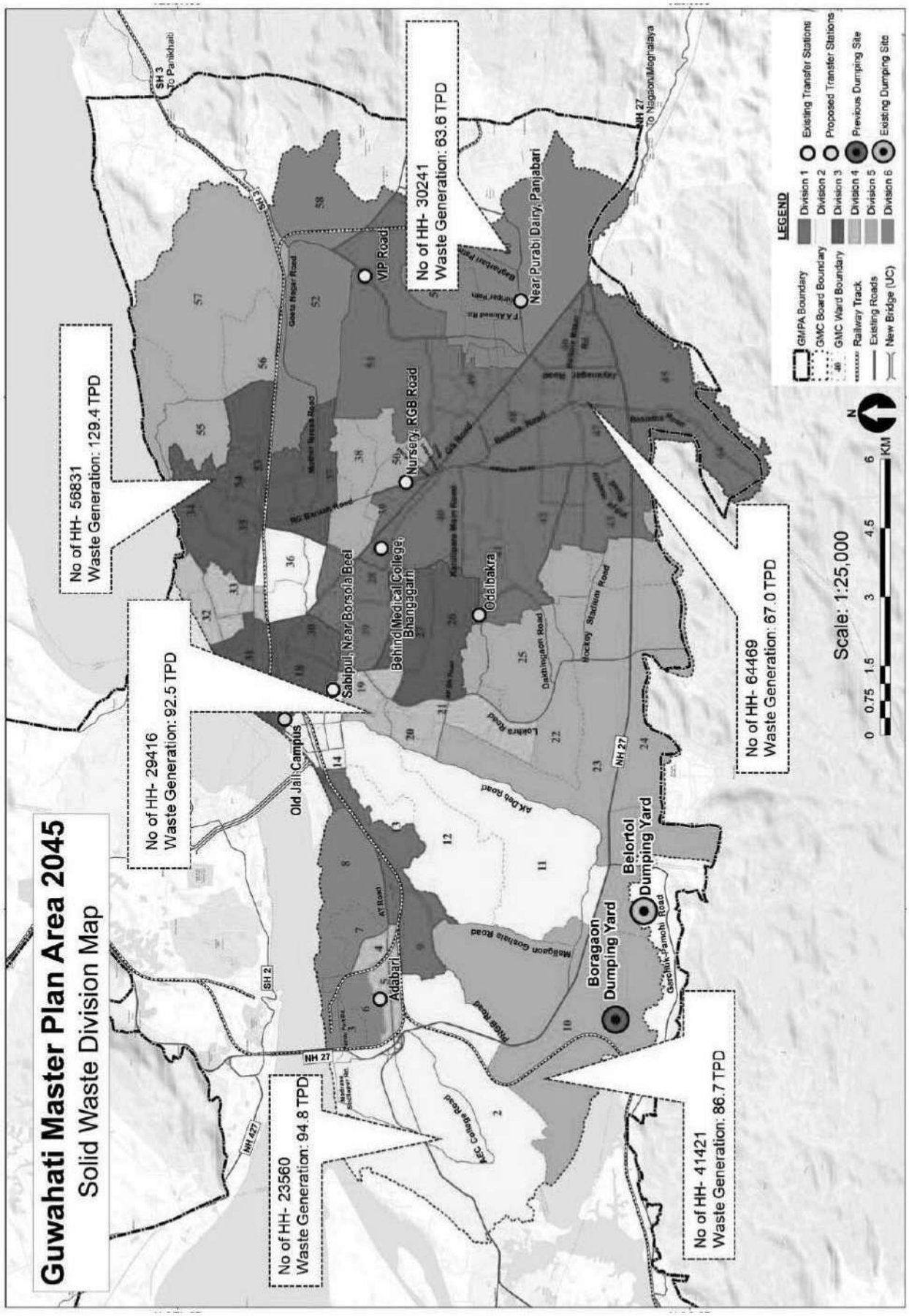


Figure 7-16: MSWM Division Map with Number of Household and Daily Waste Generation

Source of Municipal Solid Waste:

The Major Percentage of waste is generating from Residential areas and Commercial areas. Presently within GMC there are approx. 305250 households are residing whereas about 89000 commercial establishments are there. And 1331 industrial establishments area which all are mixed types. Apart from that Construction and demolition (C&D) wastes are also there however the C&D waste is not a regular generation. The following table shows the Municipal waste composition

Table 7-22: Municipal Solid Waste Composition

Waste Composition	Waste Quantity (TPD)	Percentage
Organic	254	44.2
Plastic	139	24.3
Paper	80	14.0
Glass	5	0.8
Textile	24	4.2
Mix Residues	72	12.6

(Source: IIT KGP)

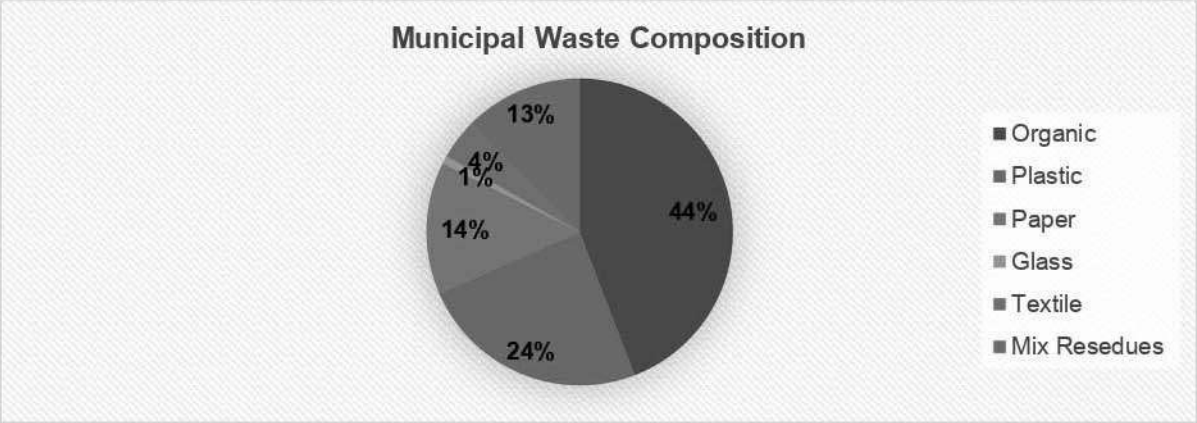


Figure 7-17:Percentage share of municipal waste components

The table 7-23 below provides average quantity and composition C&D waste:

Table 7-23: Construction and Demolition Waste Composition

Sl. No	Contents	Monthly Average (in Tons)	Percentage
1	Brick	34	50%
2	Steel	2.7	8%
3	Wood	3	5%
4	Dust & Garbage	19	28%
5	Tin Sheets	3.6	5%
6	Misc.	5.6	8%

(Source: GMC)

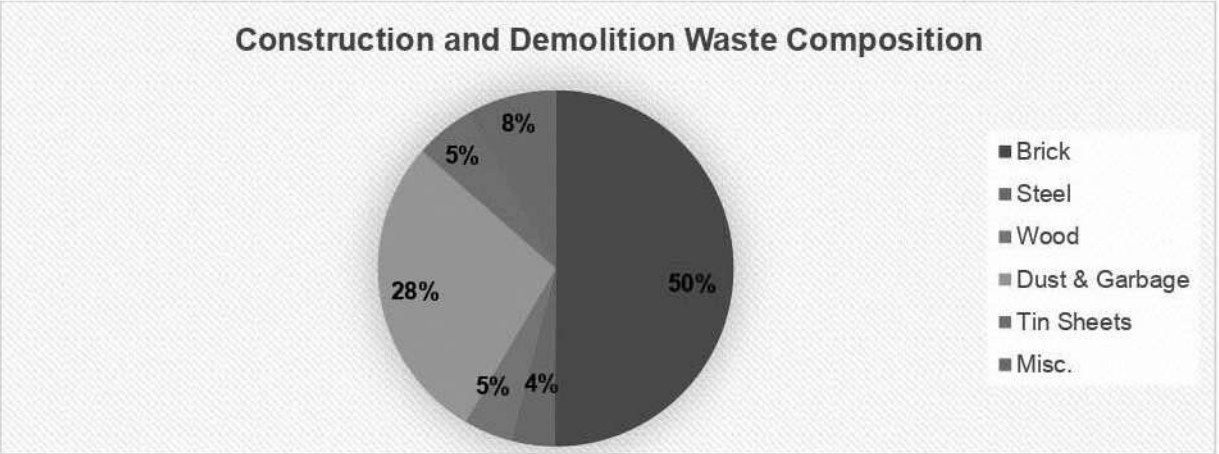


Figure 7-18: Construction and Demolition Waste Composition

Waste Collection and Transportation:

First stage is the primary collection which is door-to-door collection of the waste. Second stage of collection system is secondary collection, in which waste is collected from community bins, storage depots, and transfer stations for transportation to processing or disposal site. Type of waste collected by GMC is mentioned below:

Table 7-24 Types of waste and collection system adopted by GMC.

Type of waste	Collection system
Construction & demolition waste	Usually for large quantities, special trips were requested from the generator & they will pay the fee per trips which were prefixed by authorities. For small quantities they mix with household waste.
Litter & street sweepings	Done by street sweepers under the NGO at the ward level and GMC people at the main roads. They will mix the litter and street sweepings to household waste and carried to secondary bins
Medical waste	GMC is not responsible for the collection of waste, which is hazardous waste in nature from the hospitals. It is the hospital responsible to manage such waste.
Hotels and Restaurants	GMC will collect the waste & collect the fee according to the size and waste generated.

After the primary and secondary collection, waste is crudely dumped at the Boragaon dumpsite due to absence of any available treatment option. Due to lack of proper knowledge and infrastructure to collect and dispose, not only Guwahati every city in India today faces the problem of managing solid waste.

7.1.4.3 Primary collection of the Solid Waste

Door to Door collection system has been observed as primary collection system at Guwahati city. Total 86 NGOs are involved in collection process and from 31 wards of the Corporation in to 90 Parts, every ward at least one NGO is responsible for collection of waste. For the Door-to-door waste collection NGOs are taking Rs.30/- as user charge. Whereas, on the main streets the primary collection is done by GMC itself.

Primary collection is done by blowing a whistle by the waste collector to signal the household for waste collection. Tippers and tricycles are used for primary waste collection. The primary collection system for residential areas is in between 6-10 A.M. To avoid traffic jam, primary collection from commercial areas was done in between 2-10 P.M. Collection of wates from commercial points viz. pan bazar, fancy market, Ganeshguri, and Jalukbari etc has been done by tippers. Still, there is no source of wastes as in case of bio-degradable & non-biodegradable waste which is against the rules mentioned in MSW rules 2016. According to MSWM report provided by GMC, there is a 100% Door to Door Waste collection coverage in these 31 wards. However every household and commercial establishment are encouraged to do source segregation but only 40% of segregated data is being collected during primary collection. In order to encourage more source segregation practice, concerned organisations are strictly collecting dry wastes on Tuesdays and Fridays, and rest of the days are dedicated to wet waste collection. From GMC about 322 Tons of dry waste is being collected on these days

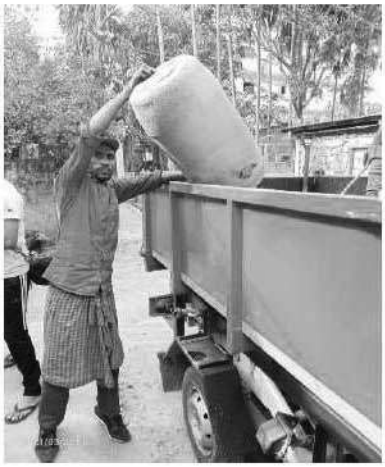


Figure 7-19: Waste Collection Practice within GMC area

Despite of having door to door waste collection services it is observed that people are dumping waste here and there, on any vacant space available in closed vicinity. This kind of practice is more observed near marketplaces, sabji-mandi or weekly market. Around 40% household uses the municipal bins for disposal of wastes, 35% dispose it in their own campus, 11% throw it on the roadside, only 6% give it to private parties on a payment basis; and around 2% garbage is burnt.[3]

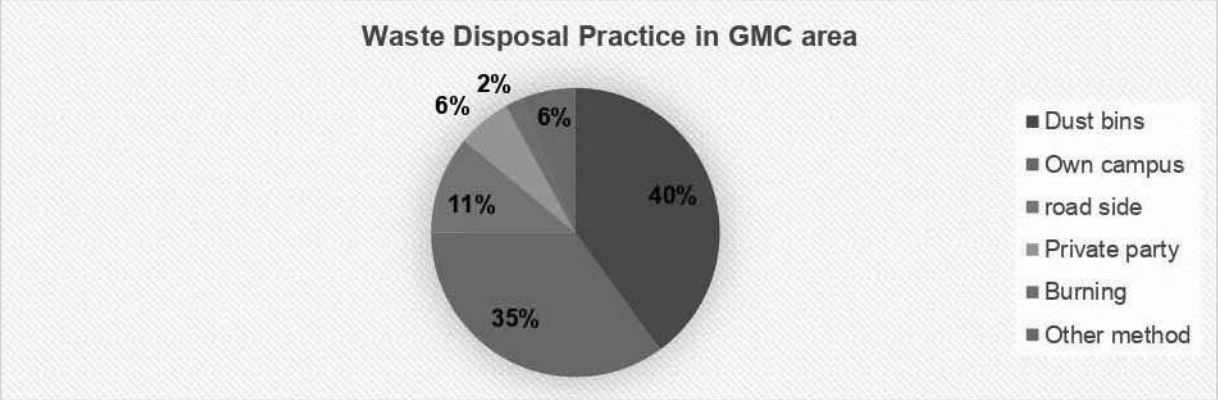


Figure 7-20: Waste Disposal Practice in GMC area

7.1.4.4 Secondary collection of the solid waste

After primary collection, waste was dumped in a secondary bin, located at each ward of every division. Around 200 numbers of medium and large size bins/containers are placed in different parts of city mainly in the major market areas, roads and commercial areas. These wastes are further collected by compactors and dumpers to the disposal site. Every day around 22 compactors and 25 dumpers are used for secondary collection. As the wastes are collected after primary collection system from collection centers to the disposal site, the process is called as secondary collection process. Guwahati Municipal Corporation is responsible for collection of secondary wastes.

Figure 7-21: Secondary Waste Collection Practice by GMC

[3] Municipal solid waste disposal: a case study in Guwahati City to mitigate the manmade disaster by Dr. Lakshmi Gogoi, 2019

Street Sweeping:

Presently, All the major roads are swept by GMC workers and NGO sweepers are responsible for all minor road sweeping. After cleaning all the roads, they collect the slit separately and transfer that to the Boragaon dumping site.

7.1.4.5 Waste Transportation

After waste collections next and major section is transportation of collected wastes by from Primary and Secondary methods. The waste is collected from these wards using Auto Tippers, Tricycles and Handcarts whose capacities are 3 Cum, 0.120 Cum and 1 Cum respectively. Table 7-25 represents available vehicles for MSW. To augment the waste collection with segregation GMC has procured another 200 nos of Auto Tipper (100 in Green Color and 100 Nos in Blue Colors) and handed over to NGOs engaged for Door-to-Door collection of waste.

Table 7-25: Details of Available Movable Infrastructure under GMC

Vehicle Type	Number
Excavator	35
Mini Skid Steer Loader	25
Dumpers	56
Garbage Compactor	46
Portable Compactor	2
Sweeping Machine	2
Auto Tipper	376
E-Rickshaw	22
Desilting Machine	33
Total	**597**

(Source: GMC)

Table 7-26: Details of Transfer Station within GMC

Transfer Station Locations	Approx. waste handled (TPD)
Nursery, RGB Road	20
Behind Medical College, Bhangagarh	12 TPD
Sabipul, Near Borsola Beel	7 TPD
VIP Road	15 TPD
Old Jail Campus	Under Process
Adabari	Under Process
Odalbakra	Under Process
Near Purabi Dairy, Panjabari	Proposed

(Source: GMC)

NGOs and GMC is responsible for collection and transportation of all municipal solid waste to Boragaon dumping site. They collect all the wastes from various parts within GMC in smaller vehicles and transfer it to the nearby transfer stations from where wastes at large quantity being transported to the dumping site. Presently there are 4 functional transfer stations located at different locations. And 4 new transfer station locations identified, out of which 3 are under process.

7.1.4.6 Waste Processing

Guwahati Municipal Corporation have taken initiative to process organic wastes, through two methods one is using Organic Waste Converter (OWC) and another one is Bio-methanation.

OWC being used to assimilate the Organic waste into Compost/ Manure. Guwahati Municipal Corporation has procured OWC, and material has already been received.

Figure 7-22: Organic Waste Composition by GMC

Bio- Methanation Plant –

- 5 TPD Bio-methanation cum Electric energy plant for segregated organic Municipal Solid Waste at Paltan Bazar
- Implementation agency: GPS Renewable
- Input: 5000 kilos per day of segregated organic waste
- Output :750 units of electricity
- Output: 450 kilos of manure
- Space requirement: 3000 sq. ft.
- Total Cost: 1.49 Crore

Figure 7-23: Bio- Methanation Plant in GMC

7.1.4.7 Processing of Legacy waste

Legacy wastes are the wastes that have been collected and kept for years at some barren land or a place dedicated for Landfill (an area to dump solid waste). Boragaon Landfill site is serving the city for several decades, and every day huge quantum of waste is being transported and dumped at site. Hence there is a urgent need to process the wastes being dumped from decades in order to accommodate future wastes. According to GMC report on MSWM, It is estimated that approximately 15 to 17 lakhs tons of legacy waste are lying at West Boragaon Dumpsite. As per Hon'ble NGT direction Bioremediation of legacy waste has been started. An agency has been selected through tendering process for segregation of legacy waste at West Boragaon Dumpsite. In the first phase total 3.61 Lakh Ton of legacy waste will be treated within 12 months' time. The work of Bioremediation has been started on 13/01/2021 with the completion date before 22/12/2021. So far more than 1 Lakh tonne of Legacy waste has been treated.

Figure 7-24: Legacy Waste Processing at Boragaon

7.1.4.8 Disposal of the collected MSW

After the secondary collection of the waste was dumped at dumping site at Boragaon situated in the division VI spreading over 120 Bighas of Land. Due to inadequate segregation at the source and collection in the city, treatment and material recovery is very difficult due to which all the waste must dump in the mixed form. Currently, in the absence of proper segregation and treatment, all the generated MSW is dumped crudely in mixed form (mixture of organic & recyclables) at the dumpsite. Although, presently GMC is disposing collected waste to the open land at Belortol near Pamohi River.

Figure 7-25: Satellite image is Boragaon dumpsite (Red circle is 500m radius).

Figure 7-26: Satellite Image of Belortol Dumpsite (Red Circle is 300m Radius)

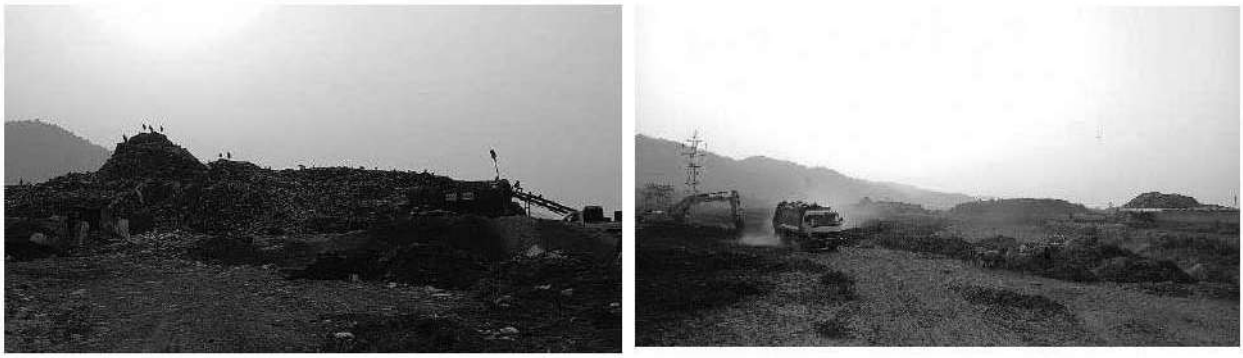


Figure 7-27: Existing Landfill Site at Belortol

7.1.4.9 Future Waste Quantification

As GMC is expending about 60-70% budget of MSWM on the MSW collection system, but they don't have an efficient collection system. Guwahati city generated around 641 TPD of MSW solely from residential households (considering 500gm per capita per day waste generation). However, presently 89000 commercial units are located within GMC, considering 800 gm of waste generation per unit per day about 72 TPD of waste is generating, however, wastes from hotel, restaurants and shopping complexes are meant to be high which data presently is not available hence did not added separately.

Table 7-27: Forecasted Domestic Waste Generation in GMPA

Year	Population	Population Within GMC	Waste Generation within GMPA	Waste Generation within GMC (TPD)	Present Collection Coverage (TPD)	Gap in Waste collection	Present Collection Coverage (%)
2021	1475651	1282046	738	641	575	66 (GMC)	90%
2031	2024565	1778783	1012	889	----	----	----
2041	3151450	2776743	1576	1388	----	----	----
2045	3863812	3379290	1932	1690	----	----	----

(Source: Compiled by Consultant)

Therefore, looking into available data and source of estimation, within GMC about 713 TPD waste is generating out of which only 575 TPD of waste is being collected which means there is only 80% collection efficiency, but it is still assumed less as many factors have not been considered due to unavailability of data.

7.1.4.10 Issues In Existing Solid Waste Management

Current waste collection infrastructure is not in very good shape. Number of bins & collection vehicles are in very bad shape which increases the effort & time during the waste collection. Also, bin provided in the city are inadequate in number due to which overfilling of the bins is a common problem in the city. At many locations waste is scattered around the secondary bins which is creating foul smell and attracts stray.

1. ***Lack of Disposal Site***

   Presently, there is no engineered landfill, and Municipal Solid Waste is dumped in open area, which can lead to ground water and soil pollution, vector naissance etc.

2. ***Lack of Primary Collection System***

   Solid waste is discharged by establishment into open plots, open drains etc. these un-organized disposal methods have resulted in the accumulation of solid

waste on roadsides, vacant plots, and storm water drains. This has resulted in a number of hygiene related problems such as breeding of flies/ mosquitoes and stray animals.

3. ***Un-hygienically Solid Waste Transportation***

Municipal Solid Waste is transported primarily in open vehicles i.e. trucks, tippers and cycle rickshaw. It is also observed that these modes of transportations are overloaded with MSW, resulting in the littering of roads during transportation. The loading and unloading of waste are carried out manually, and Safai Karamcharis involved in these activities do not use any safety measures.

4. ***In-sufficient collection and disposal of construction waste***

The construction and demolition waste generated by residents is transported in tractor trolleys and disposed at either secondary collection points or open/low-lying areas in the town vicinity.

5. ***Handling of MSW with Slaughter Waste***

Waste from the slaughters houses is disposed in open dumping sites, although there are provisions for separately disposing slaughter house waste in Guwahati Master plan area.

6. ***Disposed of Bio-medical waste without any treatment***

Presently, there is no treatment facility available for bio-medical waste in Guwahati and Medical waste is disposed off along with general MSW

7. ***Lack of primary Collection points***

Unattended waste lying in open areas is common phenomena in the entire town because of non-availability of required numbers of bins in the planning area

8. ***Multiple Handling of Wastes***

The waste is handled multiple times leading to potential health hazards for the workers as all types of wastes contains hospital waste, human waste etc are disposed in the same containers

9. ***Lack of Awareness***

There is absolute lack of awareness among people w.r.t. handling and management of waste.

Figure 7-28: Open Solid Waste Dumping along Roadside

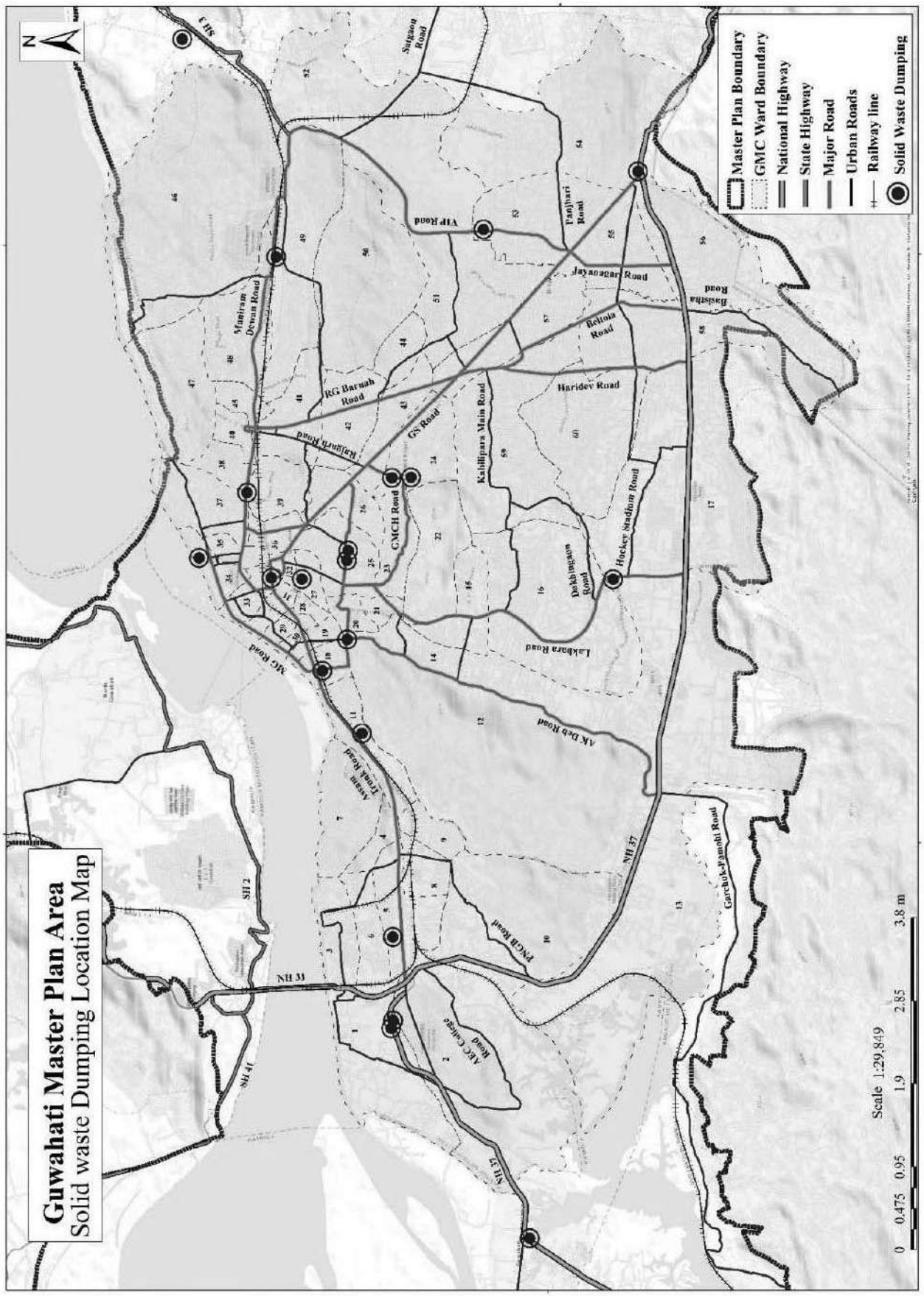


Figure 7-29: Irregular Open Solid Waste Dumping location

7.1.4.11 Status of Solid Waste Management Infrastructure as per MOUD Service Level Benchmark

Table 7-28: Solid Waste Management Status

Indicators	City (Guwahati Municipal Corporation)
Household level Coverage of SWM Services	100%
Efficiency of Collection of Municipal Solid Waste	78%
Extent of Segregation of Municipal Solid Waste	40%
Extent of Municipal Solid Waste recovered	1.3% (7.5 TPD)
Extent of Scientific Disposal of Municipal Solid Waste	No such practices are happening
Efficiency in Collection of SWM related Charges	84% (Rs. 30/- per Household)

(Source: Compiled by Consultant)

7.1.4.12 Proposed Strategies

Decentralized solid waste treatment system:

The developmental pattern of all the areas, especially Guwahati, demands the implementation of an integrated solid waste treatment system. It is felt that only a decentralized MSW Management System could help solve the seemingly intricate problem of solid waste treatment in this area in an economically viable, socially desirable and environmentally sound manner.

Public Participation:

General environmental awareness and information on health risks due to improper solid waste management are important factors which need to be continuously communicated to all sectors of the population. Building awareness among public and community about the need for a better solid waste management system is as essential as management. Public awareness and attitudes to waste can affect the people's willingness to cooperate and participate in adequate waste management practices. If people keep on throwing waste on the streets indiscriminately, the local body alone cannot keep the city clean in spite of their best efforts .Thus, it is very important to make people understand that the treatment and management of solid waste is a collective responsibility of the local authority and the community. Municipalities or local governments through participatory programs should convey this message to the people.

Collection Enhancement facilities:

- Old dustbins are to be replaced with different types of covered dustbins, which reduces the time of pickup and improves the process of primary collection of wastes.
- Sweepers may be provided with handcarts and detachable containers and be allotted a fixed area or number of houses for door to door collection. They should also be provided with safety gears and proper uniforms.
- It can be made compulsory for the management of societies/complexes to keep covered bins in which waste is to be stored at acceptable locations, to be picked up by the municipal staff.
- The local body may collect waste from community bins by using container handcarts or tricycles whichever may be convenient, for transferring the wastes to the waste storage sites by employing municipality sweepers.
- The collection service can be provided on a full-cost recovery basis using contractor services on a dayto-day basis from individual houses.
- The collection service can be provided on a full-cost recovery basis using contractor services on a dayto-day basis from individual shops also. The service of rag pickers and part-time sweepers can also be used in agreement with the shop owners.
- Sweeping of all public roads, streets, and lanes, by-lanes where there is habitation or commercial activities on either side of the street should be done daily. A list of such streets and roads together with their length and width should be prepared. The local body, keeping in view the norms of work prescribed should work out a program for their daily cleaning. However, roads and streets where there is no habitation around and do not require daily cleaning may be put in a separate group.

Provision of Solid waste Storage:

One of the immediate measures to revamp the existing collection services structure would involve provision of covered community waste bins at proper distances for the people to deposit domestic waste. This is the first step that will ensure that people do not throw their garbage on the roads and hence do not create open dump sites. This will enable the sanitation workers to transfer waste to the transportation vehicle quickly and efficiently with minimum health risk which will also help to maintain the aesthetics

of the surroundings.

The Municipal Solid Waste Rules 2016 of the Government of India have prescribed the compliance criteria for waste storage depots as under:

- Storage facilities shall be created and established by taking into account quantities of waste generation in a given area and the population densities. A storage facility shall be so placed that it is accessible to users.
- Storage facilities to be set up by municipal authorities or any other agencies shall be so designed that waste stored are not exposed to open atmosphere and shall be aesthetically acceptable and userfriendly.
- Storage facilities or "bins" shall have "easy to operate" design for handling, transfer and transportation of waste. Bins for storage of biodegradable waste shall be painted green, those of recyclable waste shall be painted white and those of other wastes shall be painted black.
- Manual handling of waste shall be prohibited. If unavoidable due to constraints, manual handling shall be carried out under proper precaution with due care for safety of workers. So, the storage and handling of SW are extremely important, and hence the steps to be taken by the Municipal authorities for storage of solid wastes are detailed in table below:

Table 7-29 Solid waste Generation Source

S.No.	Generation Source	Action Proposed
1	**Residential**	• Not to throw any waste in neighborhoods, on streets, open space, and vacant lands, in drains or water bodies. • Keep food waste / biodegradable waste in a non corrosive bin type – D1 • Keep dry/ recyclable waste in bin type – D2 • Keep hazardous waste separately
2	**Multistoried buildings, commercial complexes, private societies**	• 1 to 4 as above. • Provide separate bin type – B large enough to hold wastes generated both biodegradable and recyclable. • Direct member of the association / society to deposits waste in bins provided. Sanitary inspectors should vigil the area and fineshould be imposed for not following the actions
3	**Slums**	• 1 to 4 as above. • Use bin type –C
4	**Shops, offices, Institutions**	• 1 to 4 as above. • Store the waste in bin type - D1, D2
5	**Hotels and restaurant**	• 1 to 4 as above

		• They should arrange their own bins and dispose waste in nearby municipal bins
6	**Vegetable, fruit markets, meat, fish markets, and street Vendors**	• Keep small baskets with them and transfer waste to large bin type-A. • Shop keepers not to dispose of the waste in front of their waste or shops or open space. • Deposit waste as and when generated into bin type-A. • Fines should be imposed for not following the action
7	**Marriage halls, Community halls, Kalyan Mondaps**	• 1 to 4 as above. • Provide a large bin type -B
8	**Garden Waste**	• Compost the waste in garden itself, if possible. • Store wastes in large bags or bins and transfers it to community bins.
Note: *Bin* ***Type A*** *(volume 7 m^3),* ***Type B*** *(0.75 m^3),* ***Type C*** *(0.5 m^3),* ***Type D1*** *and* ***Type D2*** *(12 liters)*		

Segregation:

These compositional characteristics of the solid waste underline the need for proper segregation before treatment. Proper segregation of waste into different components and their separate collection can definitely lead to remarkable changes in the entire system.

The segregation of the waste would be a long drawn exercise as it involves attitudinal changes in people and will have to be done with careful planning, in a phased manner. The general public is to be first sensitized towards the whole concept and educated about the need and advantages of doing the segregation. Segregation of waste at the source itself is extremely important as municipal solid waste, which is otherwise environmentally benign on getting mixed with hazardous waste like paints, dyes, batteries, and human excreta turns hazardous. The recyclables like paper and plastic etc. become unsuitable for recycling as these get soiled by the organic matter.

Although, it would be more fruitful to sort and place different kinds of recyclables in separate receptacles, the waste could be segregated into at least two categories of biodegradable and non-biodegradable initially.

The recyclables obtained through segregation could be straightway transported to recycling units which in turn would pay certain amount to the corporations, thereby adding to their income. This would help in formalizing the existing informal set up of recycling units, and this formalization in turn could lead to multi-advantages. The biodegradable matter could be disposed off either by aerobic composting, anaerobic digestion or sanitary land filling. Depending upon land availability and financial

resources, either of these disposal methods could be adopted. Though simple land filling is the traditionally practiced system of solid waste management in the planning area, aerobic composting by wind-row method will be an appropriate option. All the nonbiodegradable waste which is non-recyclable, non-reusable shall be dumped into sanitary land fill. Biodegradable waste shall be subjected to composting. Area required for composting shall include the area for storage of unprocessed material, processing facilities for composting operation and storage for green compost.

The area required for windrow composting with 15 days composting period with moisture content between 55-60% for aerobic composting, the first turning shall be done at the 4^{th} day and thereafter every third day shall be 1.5 acres to 2 acres per 50 MT per day waste.

Reuse and Recycling:

The concepts of reuse and recycling can well be applied in solid waste management as solid waste is basically a heterogeneous mixture. In typical Indian municipal solid wastes, there is a small percentage of recyclable material and more of compostable and inert materials like ash and road dust. There is a very large informal sector of rag pickers, who can collect recyclable wastes (paper, plastic, metal, glass, rubber, etc) from the streets, bins and disposal sites for their livelihood. Thus, the rag pickers can be effectively used for the collection of reusable materials especially because the use of non recyclable packaging materials like PET bottles for soft drinks, mineral wastes, and soft -foam products and metalized plastic film coated food packing materials are on the rise. During recycling, many of these release toxic gases and ozone depleting products. So it is advisable to educate people to replace these items with eco-friendly packaging materials. The desirable home sorting mechanisms includes dry recyclable materials (e.g. glass, paper, plastic, cans etc.), kitchen and garden wastes, bulky wastes, hazardous wastes, construction and demolition wastes. Sorting can also be done just prior to waste processing or land filling.

Energy from Solid Waste:

Electricity can be produced by burning MSW as a fuel. MSW power plants, also called waste-to-energy (WTE) plants, are designed to dispose of MSW and to produce electricity as a byproduct of the incinerator operation. Mass Burn is the most common waste-to-energy technology, in which MSW is combusted directly in much the same way as fossil fuels are used in other direct combustion technologies. Burning MSW converts water to steam to drive a turbine connected to an electricity generator.

Burning MSW can generate energy while reducing the volume of waste by up to 90 percent, an environmental benefit. However, this burning MSW in WTE plants produces comparatively high carbon dioxide emissions, a contributor to global climate change. The net climate change impact of these emissions is lessened because a major component of trash is wood, paper and food wastes that would decompose if not burned. If left to decompose in a solid waste landfill, the material produces methane, a potent greenhouse gas. The concept of producing energy from MSW derives significance as it is given high priority by the Ministry of Non-Conventional Energy Sources (MNES), Government of India.

Treatment options:

The biodegradable portion of the waste is considerably high. So, aerobic composting of SW after proper segregation will be more appropriate. In selected locations especially in rural areas, Vermi-Composting can also be recommended. The manure obtained by these methods can be sold to the local public as fertilizer. Though costly, sanitary land filling can also be practiced at selected urban locations where the recovery from the waste will be very high, serving minimum ecological damage. It appears that the aerobic composting by Windrow method may be a desirable option for the management of the solid waste. The possibilities of generating energy from SW could be looked into on an experimental basis.

Biomedical wastes and its management:

Biomedical waste has been a growing concern because of the awareness in public regarding HIV, AIDS and Hepatitis B and exposure to discarded needles, syringes and other medical waste from municipal garbage bins and disposal sites. The management of biomedical waste turns important as it has serious bearing on the quality of human life. This becomes more significant especially in the context of the recent trend of establishing multispecialty hospitals in urban centers. Biomedical waste can be regarded as any waste generated during the diagnosis, treatment or immunization of human beings or animals or produced due to ac tivities of biological research, human anatomical waste, animal waste, microbiology and biotechnology waste, waste sharps, discarded medicines and cytotoxic drugs, solid wastes, liquid waste, incineration ash, chemical waste, etc. Medical wastes contain pathological waste (such as human tissues such as limbs, organs, fetuses, blood and other body fluids), infectious waste (soiled surgical dressing, swab material in contact with persons or animals suffering from infectious diseases, waste from isolation wards, cultures or

stocks of infectious agents from laboratory, dialysis equipment, apparatus and disposable gowns, aprons, gloves, towels, etc.), sharps (any item that can cut or puncture such as needles, scalpels, blades, saws, nails, broken glass, etc.), pharmaceutical waste (drugs, vaccines, cytotoxic drugs and chemicals returned from wards, outdated drugs, etc.), chemical waste (any discarded solid, liquid or gaseous chemicals from laboratories, cleaning and disinfection) etc.

Implementation of Bio-medical Wastes (Management and Handling) Rules, 2019

The Ministry of Environment and Forests issued the Bio-medical Wastes (Management and Handling) Rules, 2019 which were amended subsequently. These rules provide for segregation, packaging, transportation, storage, treatment and disposal of wastes generated by hospitals, clinics and laboratories. Bio-medical wastes (BMW) have been classified into various categories and the treatment and disposal options for each of the categories are specified. The treatment and disposal should be in compliance with the standards prescribed in Schedule V, which stipulates standards for incinerators (operating and emission standards), for waste autoclaving, for liquid waste, of microwaving and for deep burial. A schedule for implementation of BMW rules has been laid down in Schedule VI. Imposing segregated practices within hospitals to separate biological and chemical hazardous wastes that will result in a clean solid waste stream, which can be recycled easily. An Advisory Committee is to advise the prescribed authority on the implementation of these Bio-medical wastes (Management and Handling) Rules.

7.1.4.13 Processing and Disposal of Solid Waste

The solid waste can be processed by composting, vermi-composting, anaerobic digestion, sanitary land filling, incineration or any other biological processing for stabilization of wastes. Since it contains a high amount of biodegradable portion, composting may be a cost-effective option for processing. The process of microbial composting or vermi-composting may be adopted with least mechanization to keep the cost low, and to market the compost as fertilizers to adjoining villages. So the concerned municipalities are duty bound to earmark required acres of land to meet the requirement of solid waste treatment. The areas of existing dumping yards can also be developed. The rejects from these plants and domestic hazardous wastes may be carefully landfilled. The bio-medical wastes may be disposed off as per the Bio-Medical Waste Management and Handling Rules as described above.

A decentralized treatment system will be more feasible option for solid waste treatment. In combination with primary waste collection, composting improves the precarious waste situation in the communities, and residents become less dependent on the poor municipal waste collection service. Decentralized composting can be operated by an appropriate technology and implemented at reduced investment and operating costs. Manual composting in small, decentralized plants is more easily integrated in the prevailing level of development in India and the socio-economic background, as it requires labour-intensive processes. It will create employment opportunities and a source of income to the underprivileged people in the rural Guwahati. Decentralized composting allows reuse of organic waste where it is generated, thereby reducing waste quantities to be transported as well as transport costs. This may drastically reduce the overall cost of municipal solid waste treatment.

7.1.4.14 Proposals for Solid Waste Treatment

The solid waste generation expected in Guwahati Planning Area by 2045 is very high, providing compost treatment facilities for this huge quantum of wastes, though essential, may not be practically possible in a single phase. So, it is necessary to propose economically feasible and, technically viable solutions which can be implemented in a phased manner. The densely populated urban areas of GMPA are to be given first priority in providing the composting facilities for solid waste treatment. The area required for solid waste treatment and disposal facilities will be 8 hectares.

Ideally, landfill site should be located in the area, which is at the distance from the residential development where people are not get directly in contact with the site.In addition, landfill sites should not be located in close proximity to parks, forest, wetlands, airport and unstable zones.

Considering these guidelines, and the wind direction, the Master Plan prefers to have the possible locations for the landfill sites far off from the contiguous urban developable area. Therefore, three different site locations have been identified. Below is the mentioned locations of individual site,

1. This site is located near Pamohi river, at Belortal within planning area near NH-27 road. This is plane land with no vegetation and away from residential development.

1.7.4.15 Disposal of Hazardous Waste

The Notification from the Government of India, Ministry of Environment dated 27th March 2019, which deals with the collection of Bio-Medical Wastes entrusts the liability of its disposal with the waste producer itself. Thus the management of bio-medical waste is not the responsibility of Municipalities. But, however, they can assist in the management of biomedical wastes on a full cost recovery basis without sharing any legal responsibilities. It is advisable to have bio-medical facility for the entire Guwahati Planning Area. The bio-medical wastes collected from spots can be stored in selective transfer stations and can be transported to the facility. If so desired, the authorities can formulate an action plan for implementing this plant through some competent agencies and can suitably charge for the treatment and disposal of bio-medical wastes. The solid waste dumping sites closest to industrial sites will be a more appropriate option.

7.1.5 Power Supply

The Guwahati Power zone is covered by three electrical circles viz., Guwahati Electrical Circle I, Guwahati Electrical Circle II and Guwahati IRCA. Distribution of Power in Guwahati Master Plan Area is mainly from the Kahilipara grid substation. The power is fed to this grid substation from the following power stations:

- Chandrapur Thermal Power Station
- MSEB Hydel System
- Bongaibaon Thermal Power Supply
- Namrup PS
- Lokwa PS
- Mobile Gas Turbine

Apart from the Kahilipara grid substation, there are also Shishugram grid substation in North Guwahati area and Bagjhap sub-station in the army cantonment area. There are the following substations installed area wise by 33KV lines under the Kahilipara grid sub-station and within the Guwahati Electrical Circle

- Fatasil Sub-station
- Jalukbari substation of installed capacity of 5000KVA
- Paltanbazar substation of installed capacity of 5000KVA
- Jawaharnagar substation of installed capacity of 5000KVA
- Narengi substation of installed capacity of 10000 KVA
- Ulubari substation of installed capacity of 10000 KVA.
- Uzanbazar sub-station
- Zoo Road Sub-station
- Medical College sub-station

- Gorbhanga substation

The substations under the GEC II are located at Borjhar, Mirza, Rani, Chaygaon, Boko. The locations of the different sub-stations are shown in the adjoining map of the Guwahati Electrical Circle.

As per the received data from APDCL, Total power generated from all grid connected sources in the city is 10,63,14,000 kwH and total connected load in city 12,25,425.38 KW. Total Power Consumption in city 92836.031 MW and total Units lost due to AT&C loss is 170 MW. Total electricity consumption for municipal services as 7,25,000 kwH.

7.1.5.1 Power Supply Demand Projection

The power demand for 2045 is calculated by assuming 2.74 kWh per capita per day considering domestic, commercial, industrial and other requirements as per URDPFI guidelines 2015. The power demand for the 2045 will be 221.1 MW.

Table 7-30: Power Demand for 2045

Sr. No.	Particulars	Demand		
		2021	2031	2045
1	**Projected Population**	1475651	2024566	3863812
2	**Power Requirement @2.74 kWh per capita per day**	4043.28 MW	5547.31 MW	10586.84 MW

**Power demand – 2.74 kWh per capita per day considering domestic, commercial, industrial and other requirements as per URDPFI guidelines 2015*

As per the population 2031 for Guwahati Planning Area, the Power Demand is 5547.31 MW considering 2.74 kwh per capita per day. The Power Requirement for 2045 will be 10586.84 MW.Tthe possibility of use renewable energy is to be explored and promoted. The strategies are proposed below:

7.1.5.3 Proposed Strategies

- There are various other sources, such as Wind energy and solar energy for generating power which is required to be explored.
- Additional solar energy to be sold to public grid/ electricity authority.
- Sector-wise power demand needs should be worked out which will be helpful in proper planning & estimating future power requirement.
- Incorporation of Renewal Power Obligations (RPO) in building byelaws (applicable to major building projects >20,000 sq.ft.)
- Tax concession on material and appliances procured for renewable energy products.

7.2 Social Infrastructure

Social infrastructure plays an important role to provide quality of life to the residents of the city. The effectiveness of social infrastructure in achieving the objective of the city development plan would depend upon its capacity to contribute to improvement in the quality of life, enhanced self-dependency, and city's sustainability. The level of social infrastructure shall aim at the creation of a liveable city through reducing the sense of alienation among the residents with less dependence on other settlements for basic infrastructure.

Social infrastructure refers to the facilities and mechanisms that ensure education, health care, community development, and social security, recreational and social welfare. The development cannot be looked at in isolation without considering the basic needs of the people, and a significant level of investment is needed in this sector. Usually, this development is referred to as the commitment towards realizing the vision of the city. In the present chapter, the various data related to social infrastructure in Guwahati have been collated and presented.

7.2.1 Health

Assam ranks 30th among 36 States/UTs in terms of human and gender development indices (Assam SDR). Public expenditure on health and education as a percentage of SDP is higher than the average of all states. Assam aims to achieve the goal of health for all through the establishment of three tier health institutions i.e., Sub Centre, Primary Health Centre, and Community Health Centre. The government had taken up several plans for the development of primary health care institutions as per the recommendations of the Shukla Commission. The list of the basic health infrastructure provided by the state government as of 2016 at the State level and District level is as under

Table 7-31: Government Hospitals, and other Health infrastructure in Assam and Kamrup district as on 2016

Health Infrastructure	Assam	Kamrup Rural	Kamrup Metro District
Civil Hospitals	25	1	1
Sub Divisional Civil Hospital	13	1	0
Primary Health Centre	1014	65	45
Sub Centres	4662	279	51
First Referral Unit	62	5	1
Community Health Centers	151	13	3
Diagnostic Centre	372	17	62
Nursing Home	249	5	17
Beds	18356	940	2559

(Source: Mission Director, National Health Mission Assam, 2019)

Table 7-322 provides the details of Government and private hospitals located in Guwahati along with available facilities i.e., number of beds, doctors, nurses, and other Staff. Presently in Guwahati four Government hospitals and five NGO-owned hospitals are located. Other than these fourteen private hospitals are located in Guwahati.

Table 7-32 Hospitals in Guwahati

Sr. no	Name	Owner ship	Location	No. of Beds	Doctors	Nurses	Other Staff
1	Guwahati Medical College	Govt.	Bhanghagarh	1587	73	185	180
2	MMC Hospital	Govt.	Panbazar	350	25	68	150
3	Central Railway Hospital	Govt.	Maligaon	390	41	120	150
4	CRPF Base Hospital	Govt.	6th Mile Khanapara	100	11	24	88
	Sub-Total (A)			**2,427**	**277**	**312**	**2,188**
5	M/s Guwahati Lions Eye Hospital	NGO	K.C. Road	6	3	4	15
6	M/s Marwari Maternity Hospital	NGO	S J Road, Athgaon	80	15	30	150
7	M/s Sankardev Netralaya	NGO	Beltola	200	50	35	200
8	M/s Chatribari Christan Hospital	NGO	K.C. Road, Chatribari	155	10	40	80
9	Red Cross hospital	NGO	Chandmari	30	6	7	30
10	M/s Brahmaputra Hospital Pvt. Ltd.	Pvt.	G S Road, Sixth Mile	50	20	25	100
11	M/s Good friend Hospital & Research Center	Pvt.	G.S. Road	35	4	10	10
12	M/s Vision Hospital,	Pvt.	A.T. Road, Athgaon	6	2	6	4
13	M/s H.M. Hospital & Research center Pvt. Lmt.	Pvt.	Hatigaon Path,	30	3	20	40
14	M/s Down Town Hospital Lmt.	Pvt.	G.S. Road, Dispur	300	90	-----	-----
15	International Hospital	Pvt.	Christian Basti, G S Road	118	35	110	300
16	Guwahati Neurological R Centre (GNRC)	Pvt.	Super Market,	175	72	187	380
17	B Baruah Cancer Hospital	Pvt.	R G Baruah road	120	25	30	80
18	Govt. Ayurvedic Hospital	Pvt.	Jalukbari	100	40	20	20
19	Lokpriya Gopinath Bordoloi TB Hospital	Pvt.	Gopinath Nagar Kalaphar	250	11	27	50
20	Wintrob Hospital	Pvt.	G N B Road, Ambari	20	4	10	20
21	Eye Foundation Hospital	Pvt.	R G Baruah road	6	2	3	5
22	Guwahati Psychiatric Hospital	Pvt.	Panjabari	8	1	2	6
23	Institute of Child & Women Health Care	Pvt.	Zoo Narangi Road	35	4	5	12
	Sub-Total (B)			**1,724**	**397**	**82**	**1,502**
	Total (A+B)			**4,151**	**674**	**394**	**3,690**

(Source: Guwahati Municipal Corporation and Primary Survey by Consultants)

Table 7-333 provide details of private Nursing homes and the available facilities.

Table 7-33 : Private Nursing Homes in Guwahati

Sr. no.	Name	Location	No. of Beds	Doctors	Nurses	Other Staff
1	M/s. Borthakur Clinic Pvt. Ltd.	Kharghuli Path	35	15	20	80
2	M/s Central Clinic & Nursing Home	M.S. Road	30	3	20	12
3	Dispur Polyclinic & Nursing Home	G.S. Road, Ganeshghuri	70	12	30	120
4	M/s Eastern Nursing Home	G.N. B Road, Bamunimaidan	44	8	15	30
5	M/s Scared Home Hospital & Research Center	B.K. Kakati Road	24	8	14	30
6	Azile Hospital	Jayanagar, Beltola	30	15	30	30
7	M/s Nightingale Hospital Pvt. Ltd.	Birbahi Path, Ganeshghuri	22	8	15	15
8	M/s Gurusharan Polyclinic	Md. Shah Road ,	30	10	45	25
9	M/s Midland Hospital & Research Center	R.G. Baruah Road	23	12	10	40
10	Advance Nuroscience Hospital	Kahilipara Path	35	10	20	25
11	M/s Sakia Memorial Nursing Home	A.T. Road, Adabari	25	5	15	15
12	M/s Good Health Hospital, Pvt.Lmt.	G.S. Road	34	7	28	75
13	M/s City Heart Hospital	Rajgarh	30	8	15	30
14	M/s Sidhanta Meterniry & Nursing Home	Kharga Choudhury Path	10	4	6	20
15	Kumar Nursing Home	Kumarpara	25	6	10	15
16	Dr. Kalicharan Das Nursing Road	Kalaphar	32	5	22	70
17	NEMCARE Hospital	Bhanghgarh,G S Road	50	18	35	30
18	Care Home Lithotripsy	Baminimaidan,	24	9	10	15
19	East End Nursing Home	Baminimaidan,	40	15	30	80
20	M/s City Nursing Home	R.K.Choudhury Path	9	2	7	15
21	M/s Goenka Nursing Home	Gori Sharma Colony Path	25	18	20	10
22	M/s E.G. Nursing Home	Narengi	10	2	12	8
23	M/s Pragjyoti Eye Cancer Pvt. Ltd.	Zoo-Narengi Path	10	4	3	10
24	M/s Aruna Memorial Hospital Pvt. Ltd	Rajgarh Road	29	11	24	21
Total			**696**	**215**	**456**	**821**

(Source: Guwahati Municipal Corporation and Primary Survey by the Consultants

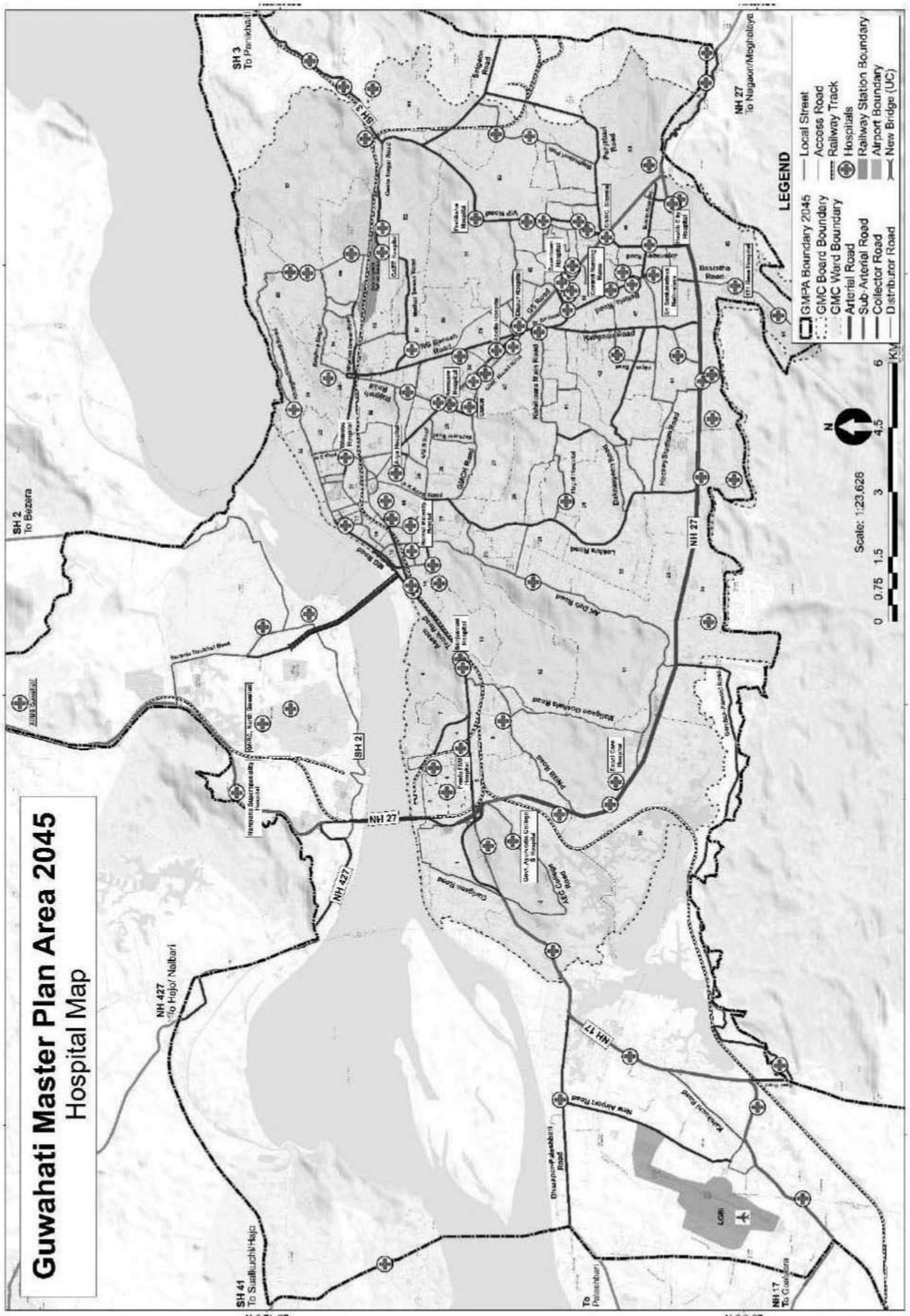


Figure 7-30:Primary health centres and major hospital facilities in GMPA

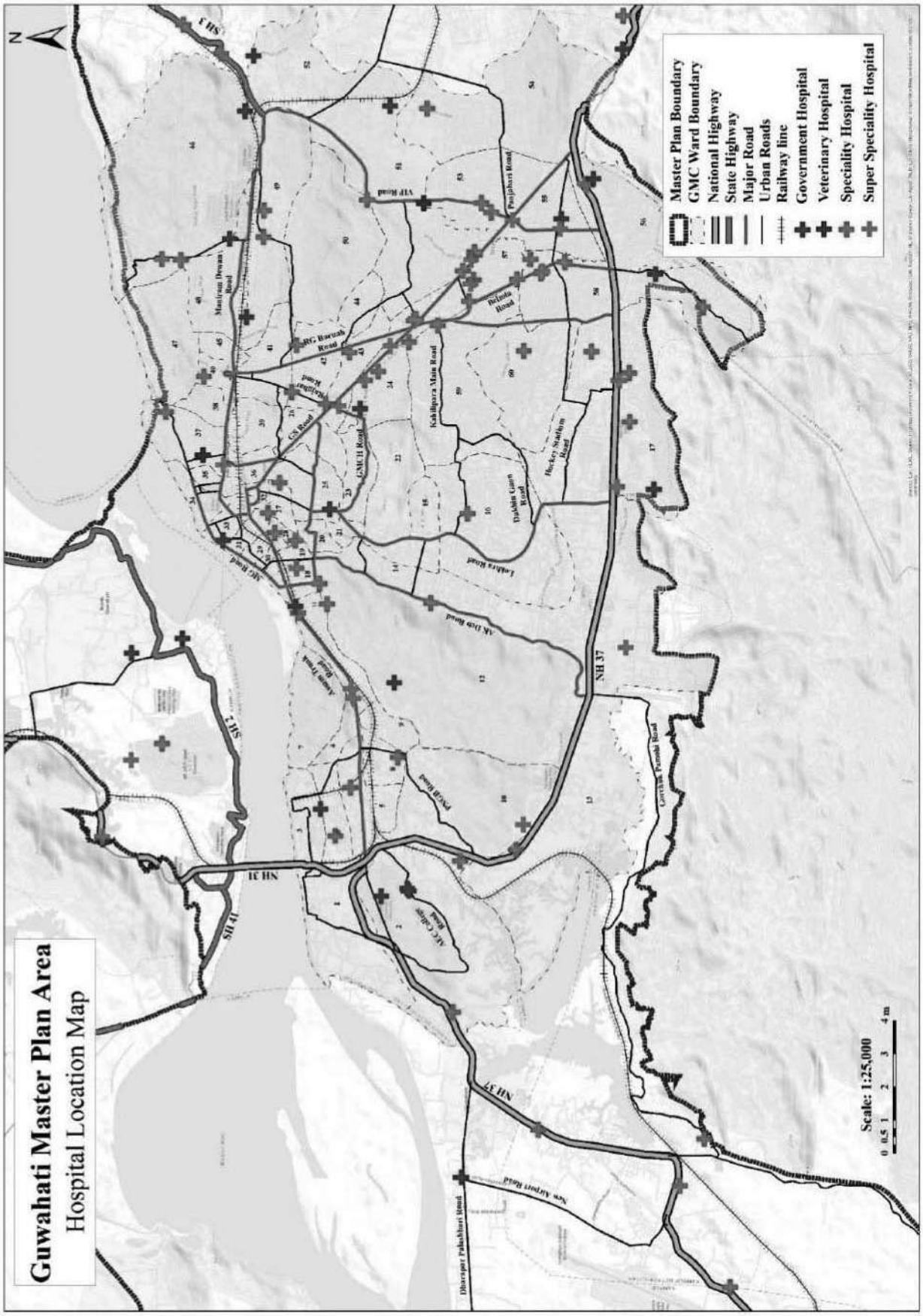


Figure 7-31: Health Facility Locations in Guwahati

Table 7-34: Demand-Supply Gap Assessment of Medical Services

Existing Scenario					Desired Level as per URDPFI guideline	Short Term		Medium Term		Long Term		Land Requirement as Per Future Need						
Sr. No.	Particular	Indicator Unit (number)	Current Level (2011)	Current Gap		2021		2031		2045		Area Require (Ha)	Short Term		Medium Term		Long Term	
	Population		1141699			1475651		2024565		3863812								
1	Hospital					Demand	Gap	Demand	Gap	Demand	Gap		2021		2031		2045	
2													Gap	Total Area Required (Ha)	Gap	Total Area Required (Ha)	Gap	Total Area Required (Ha)
3		Dispensary	112	0	15000	98	0	135	23	258	123	0.08 to 0.12 Ha	0	0	23	1.8	123	9.8
4		Nursing home, child welfare and maternity centre	17	8	45000 to 1 lakh	33	16	45	12	86	41	0.20 to 0.30 Ha	16	3.2	12	2.4	41	8.2
5		Polyclinic	45	0	1 lakh	15	0	20	0	39	0	0.20 to 0.30 Ha	0	0	0	0	0	0.0
6		Intermediate Hospital (Category B)	7	4	1 lakh	15	8	20	5	39	19	1.00 Ha	8	8	5	5	19	19.0
7		Intermediate Hospital	34	0	1 lakh	15	0	20	0	39	5	3.70 Ha	0	0	0	0	5	18.5

		(Category A)															
8		Multi-Specialty Hospital	4	7	1 lakh	15	11	20	5	39	19	9.00 Ha	11	99	5	45	19	171.0
9		Specialty Hospital	3	8	1 lakh	15	12	20	5	39	19	3.70 Ha	12	44.4	5	18.5	19	70.3
10		General Hospital	1	4	2.5 lakh	6	5	8	2	15	7	6.00 Ha	5	30	2	12	7	42.0
11		Family Welfare Centre	3	20	50,000	30	27	40	10	77	37	500 - 800 sqm	27	1.35	10	0.5	37	1.85
12		Diagnostic centre	62	0	50,000	30	0	40	0	77	15	500 sqm to 800 sqm	0	0	0	0	15	0.75
13		Veterinary Hospital for pets and animals	21	0	5 lakhs	3	0	4	0	8	0	2000 sqm	0	0	0	0	0	0
14		Dispensary for pet animals and birds	17	0	1 Lakh	15	0	20	3	38	19	300 Sqm	0	0	3	0.1	19	0.57

(Source: Compiled by Consult)

Table 7-35: Assessment of Future Health Facility Requirements

Sr. No.	Health facility in GMPA	Existing Number	Total Future Demand(2045)	Extended Future Demand	Future Land Requirements(Ha.)
1.	Dispensary	112	258	146	11.68
2.	Nursing home, Child welfare and maternity centre	17	86	69	13.8
3.	Polyclinic	45	39	0	0
4.	Intermediate Hospital (Category B)	7	39	32	31
5.	Intermediate Hospital (Category A)	34	39	5	18.5
6.	Multi-Specialty Hospital	4	39	35	315
7.	Specialty Hospital	3	39	36	133.2
8.	General Hospital	1	15	14	84
9.	Family Welfare Centre	3	77	74	3.7
10.	Diagnostic centre	62	77	15	0.8
11.	Veterinary Hospital for pets and animals	21	8	0	0
12.	Dispensary for pet animals and birds	17	38	22	0.7
Total Area Requirement for Future Health Facilities					**612.2 Ha**

(Source: Compiled by Consultant)

Based on the URDPFI Guidelines 2015, the demand of health facilities in 2045 for Guwahati Master Planning Area is worked out. To serve future population there will be a need of 14 General hospital, total 37 Intermediate Hospitals, 36 Special Hospitals till 2045. This shall be spatially distributed in the planning area. Based on the area requirement for each unit, the land requirement for the above-mentioned health facilities is worked out. There will be a need of 612.2 Ha. of land for the above-mentioned health facilities.

7.2.2 Educational Facility

This section focuses on the adequacy of educational facilities (primary, secondary, senior secondary schools and colleges) at village level and urban level within in the GMDA area.

- Primary Education
- Secondary Education
- Higher Secondary Education
- Higher Education

7.2.2.1 Primary, Secondary and Higher Secondary Education

Primary, Secondary and Higher Secondary Education have been clubbed together and discussed under one broad subsection, while Higher Education is kept as a separate sub-section.

The following table provides an overview of the general educational infrastructure available in the GMDA:

Table 7-36 Number of Institutions in GMDA

Institution	No. of Institution			No. of Teachers			Students		
	Govt.	Pvt.	Total	Govt.	Pvt.	Total	Govt.	Pvt.	Total
Primary (1-5)	237	6	243	1158	52	1210	24605	381	24986
Primary with Upper Primary (1-8)	40	18	58	445	240	685	6814	2817	9631
Primary with Upper Primary and Secondary (1-12)	3	37	40	108	2019	2127	742	46390	47132
Upper Primary Only (6-8)	15	0	15	134	0	134	2266	0	2266
Upper Primary Only with Secondary and Higher Secondary (6-12)	19	1	20	667	24	691	8085	846	8931
Primary with Upper Primary and Secondary (1-10)	20	176	196	444	3190	3634	7232	56343	63575
Upper Primary with Secondary (6-10)	37	1	38	621	8	629	10935	33	10968
Secondary only	14	6	20	114	39	153	1501	342	1843
Secondary with Hr. Secondary	4	0	4	14	0	14	125	0	125
Arts, Science, Commerce College*	14	12	26	690	229	919	8249	3440	11689
Total	**403**	**257**	**660**	**4395**	**5801**	**10196**	**70554**	**110592**	**181146**

(Source: UDISE, 2019-20)

The following Figure 7-32 and Figure 7-33 illustrates the locations of primary and secondary school locations within GMDA area. In the figure 7-32, all the primary school location points are surrounded by a 1 km buffer, assuming that it is serving 1 Km proximity. It can be observed that majority of the primary schools are located along major roads and clustered in the core urban region. Figure 7-33 reveals that there are lesser number of secondary schools and all the secondary schools are assumed to be serving it 1.5 km radius proximity. It can be observed that secondary schools are located majorly withing south central Guwahati and other parts of Guwahati needs to be served with secondary school facility.

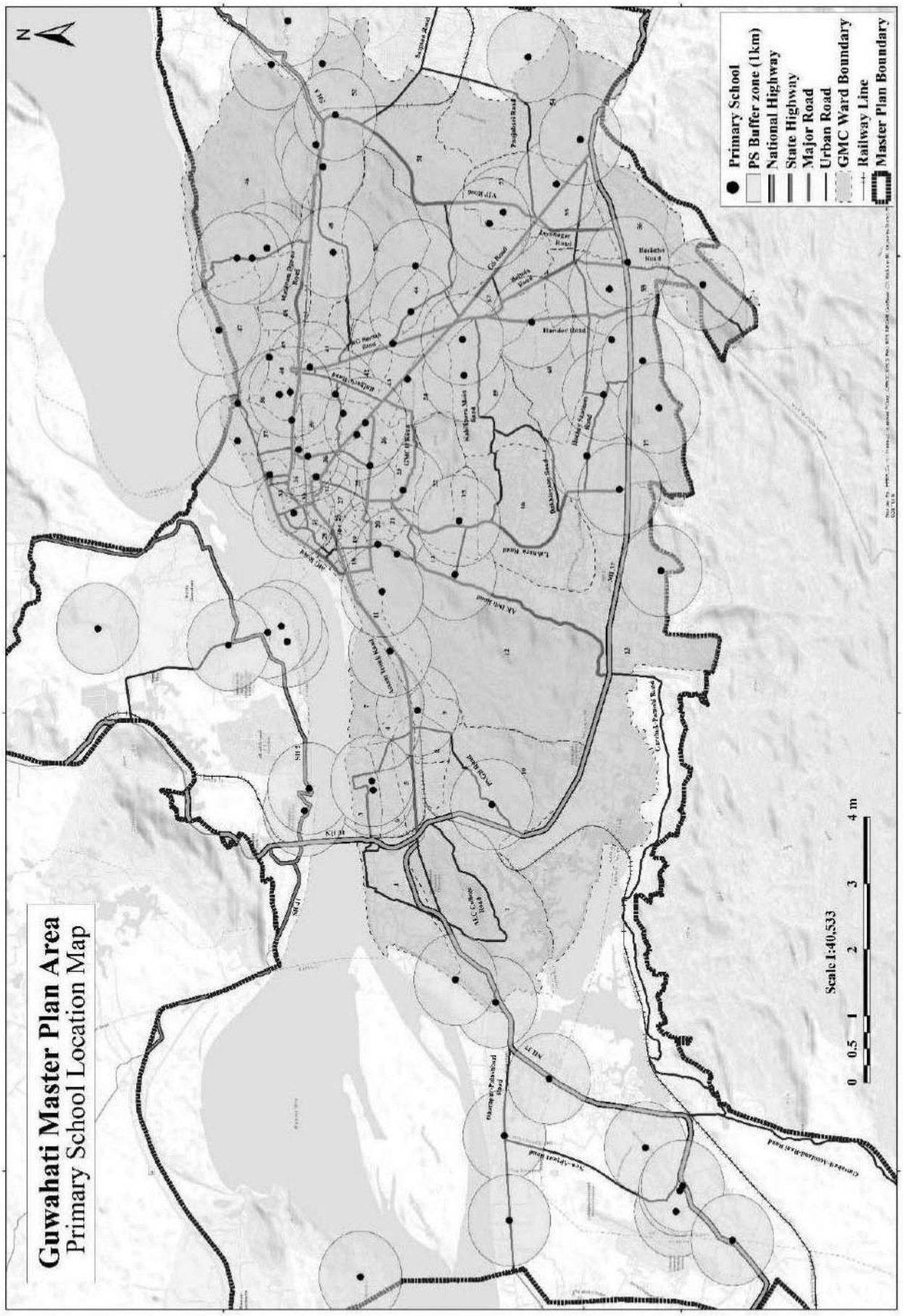


Figure 7-32: Primary School Locations In Guwahati

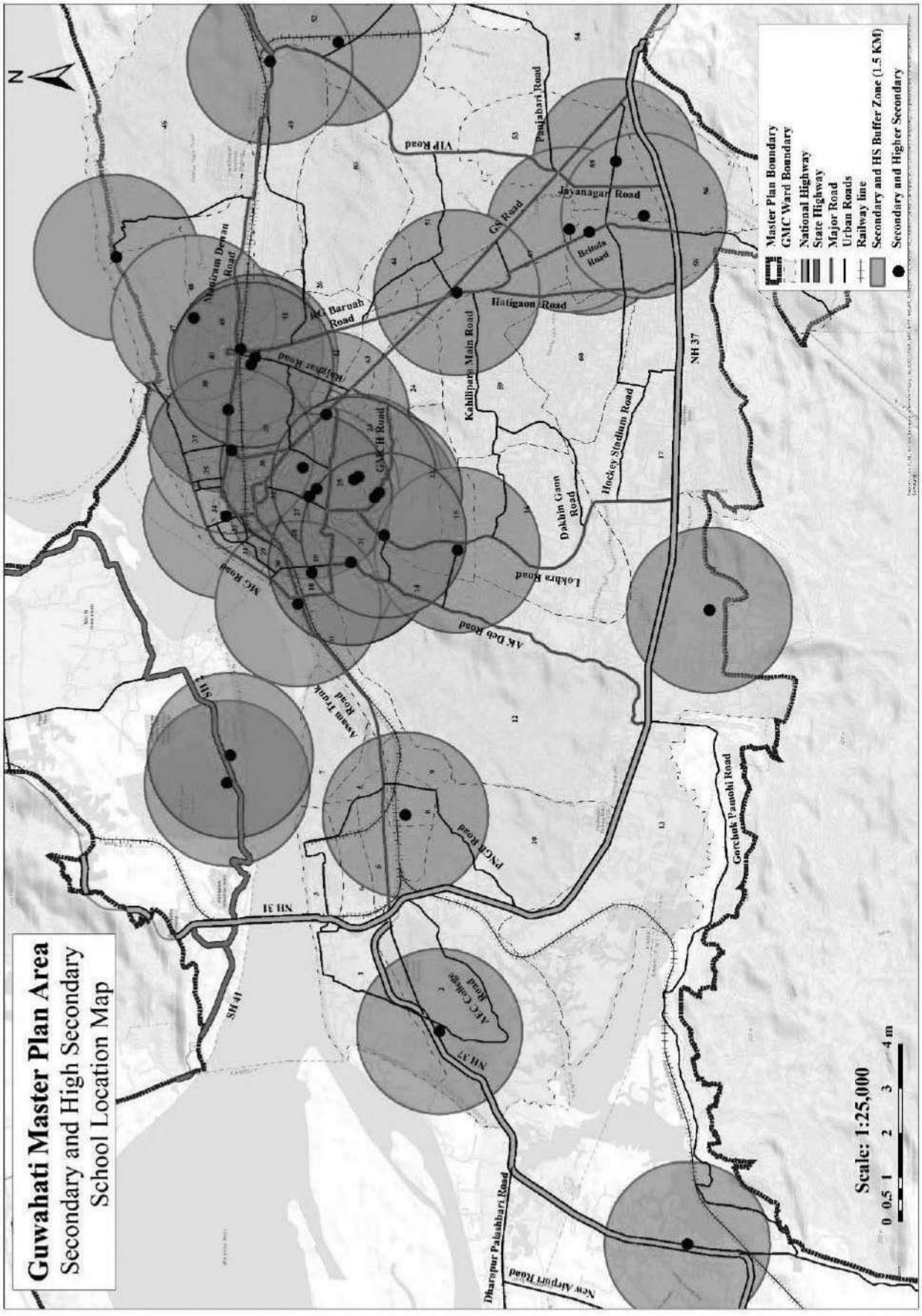


Figure 7-33: Secondary and Higher Secondary School Location Map

Table 7-37: Assessment of Existing Educational infrastructure (Primary and Secondary) and future requirements

Existing Scenario					Desired Level as per URDPFI guideline	Short Term		Medium Term		Long Term		Land Requirement as per Future Need						
Sl No.	Particular	Indicator Unit (number)	Current Level	Current Gap		2021		2031		2045		Area required (Ha)	Short Term		Medium Term		Long Term	
1	Population		1141699			1475651		2024565		3863812			2021		2031		2045	
2	School					Demand	Gap	Demand	Gap	Demand	Gap		Gap	Total area required (Ha)	Gap	Total area required (Ha)	Gap	Total area required (Ha)
3		Pre-Primary, Nursery School	243	214	2500	590	347	810	220	1546	736	0.08 ha	347	27.8	220	17.6	736	58.88
4		Primary School (Class I - V)	58	170	5000	295	237	405	110	773	368	0.40 Ha	237	94.8	110	44	368	147.2
5		Secondary School (VI - XII)	245	0	7500	197	0	270	25	515	245	1.80 Ha	0	0	25	45	245	441
6		Integrated School without hostel facility (I - XII)	88	0	1 Lakh	15	0	20	0	39	0	3.50 Ha	0	0	0	0	0	0
7		Integrated School with hostel facility (I - XII)	9	2	1 Lakh	15	6	20	5	39	18	3.90 Ha	6	23.4	5	19.5	19	74.1
8		School for Physically Challenged	2	1	4.5 Lakh	3	1	4	1	9	4	0.70 Ha	1	0.7	1	1	4	2.8
9		School for Mentally Challenged	1	0	10 Lakh	1	0	2	1	4	2	0.20 Ha	0	0	1	0.2	2	0.4

(Source: Compiled by Consultant)

7.2.2.2 Higher Education

There are eight universities in Assam as under, out of which Guwahati University is located in the GMA area:

- Gauhati University (Guwahati)
- All India Institute of Medical Sciences (AIIMS), Guwahati
- Indian Institute of Technology, Guwahati (Guwahati)
- Cotton University
- Royal Global University
- Assam Science and Technology University

Gauhati University

Gauhati University is the first University established in Northeast India. The University was established under the Gauhati University Act. 1947 (Assam Act, XVI of 1947) in the year 1948. The University is located at Jalukbari within the Guwahati city area. The campus area has been developed into a small township now known as Gopinath Bardoloi Nagar. It has now about 5000 population including 1500 students residing in the hostels. Besides residential quarters of teachers, officers and employees of the University, there are 20 halls of residence for university students. The necessary civic amenities such as health services, water supply, street lighting, internal roads, guest house-cum-club, post and telegraph office, a branch of State Bank of India, canteens, a market, parks, playgrounds, auditorium etc are provided in the campus.

The University has four faculties in its residential campus- Arts, Commerce, Science and Law. Besides, the faculty of Medicine and the faculty of Engineering are functioning within the constituent Gauhati Medical College and the Assam Engineering College respectively

Indian Institute of Technology, Guwahati

Indian Institute of Technology, Guwahati, the sixth member of the IIT fraternity, was established in 1994. The academic programme of IIT Guwahati commenced in 1995. At present the Institute has eleven departments covering all the major engineering and science disciplines, offering B. Tech., B. Des., M. Tech., Ph.D. and M.Sc. programmes. The total area of the campus is 285 hectare.

All India Institute of Medical Sciences (AIIMS), Guwahati

All India Institute of Medical Sciences, Guwahati (AIIMS Guwahati) is a public medical school and hospital based in Changsari, Assam, India, and one of the All India Institutes of Medical Sciences (AIIMSs). On 26 May 2017 Prime Minister Narendra Modi laid the foundation stone of the institute.

The academic programme for the first batch of MBBS students was inaugurated on 12 January 2021 by union health minister Harsh Vardhan. The institute became operational with 50 MBBS students, one of the four AIIMSs to become operational in academic year 2020-21. In 2021, the institute was functioning from a temporary campus at Narakasur Hilltop of Gauhati Medical College with AIIMS Bhubaneswar mentoring it.

Cotton College

Cotton University (formerly known as Cotton College) is a public state university located in Guwahati, Assam, India. It was established in 2017 by the provisions of an Act from the Assam Legislative Assembly which merged Cotton College State University and Cotton College.

Cotton College was established in 1901 by Sir Henry Stedman Cotton, the Chief Commissioner of the erstwhile British province of Assam. It was the oldest institute of higher education in Assam, and within the whole of Northeast

India. The college was the centre of the freedom movement and the literary and cultural movements of the state which aimed to build the identity of Assam as a distinct, integral component of India. In 2015 the college was declared as Special Heritage College.

Other Institutes for Higher Education

Apart from the University and IIT there are several colleges of Higher Education, a list of which is provided as under:

Table 7-38: Higher Education institutions in Guwahati

Institute	Location
Government Ayurvedic College and Hospital	Jalukbari, Guwahati
Indian Institute of Information Technology	Guwahati
Guwahati Medical College and Hospital	Bhangagarh, Guwahati
Regional College of Nursing	Bhangagarh, Guwahati
Regional Dental College	Bhangagarh, Guwahati
B. Barooah College	Ulubari
Banikanta College Of Teachers Education	Guwahati
Cotton College	Guwahati
College Of Education	Guwahati
City College	Panjabari Road
Dispur College	Dispur
G.U. Law College	Guwahati
Guwahati Commerce College	Guwahati
Guwahati College:	Bamunimaidan
Govt K.K Handique Sanskrit College	Guwahati
Govt. B.R.M. Law College	Guwahati
Handique Girls College	Guwahati
J.B. Law College	Guwahati
Assam Engineering College	Jalukbari, Guwahati

(Source: Compiled by Consultant

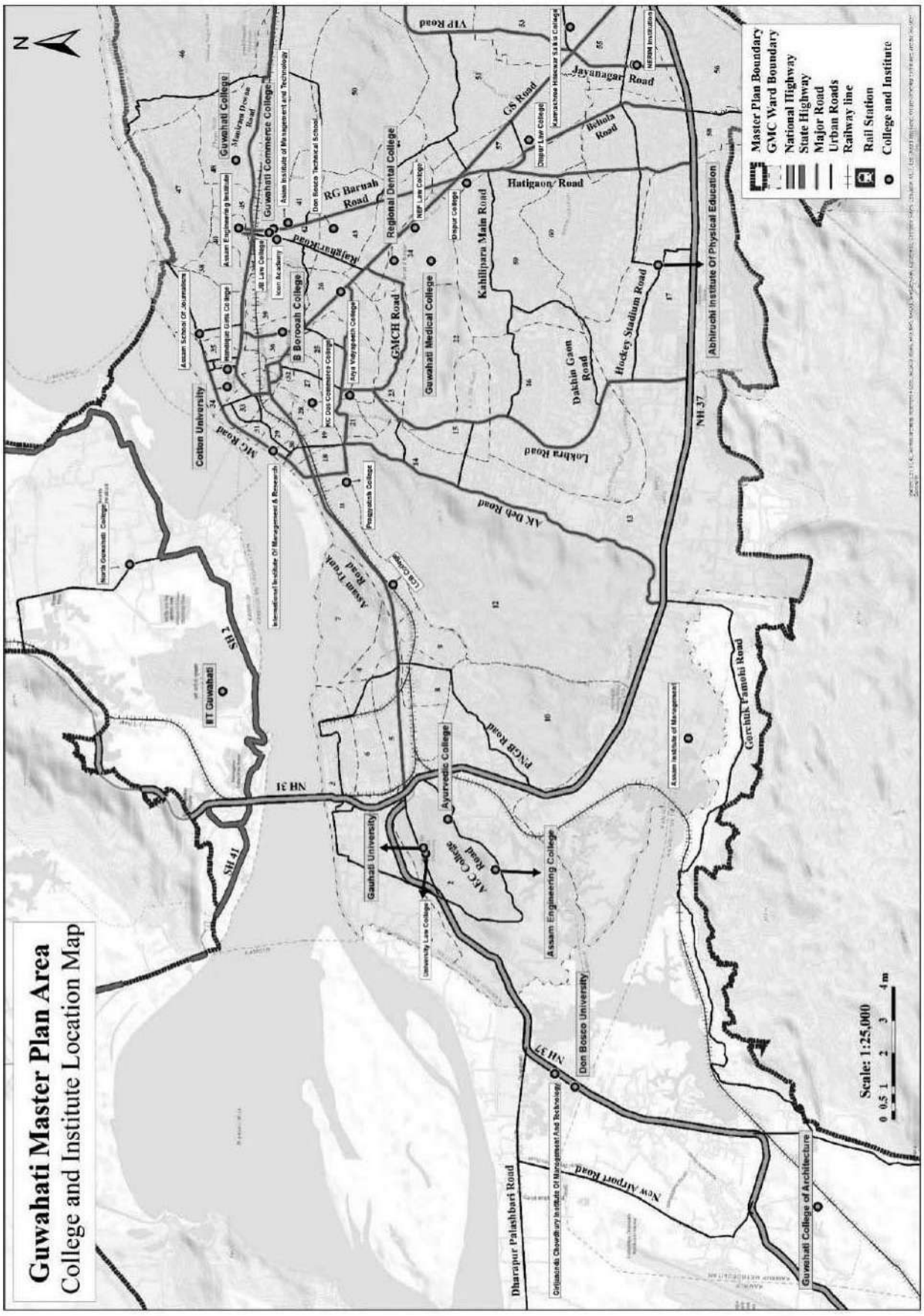


Figure 7-34: College and Institute Locations in Guwahati

Table 7-39: Assessment of Existing Higher Educational Infrastructure and future requirements

Existing Scenario					Desired Level as per URDPFI guideline	Short Term		Medium Term		Long Term		Land Requirement as per Future Need						
Sl. No.	Particular	Indicator Unit (number)	Current Level -2011	Current Gap		2021		2031		2045		Area Required (Ha)	Short Term		Medium Term		Long Term	
1	Population		1141699			1475651		2024565		3863812			2021		2031		2045	
													Gap	Total Area Require (Ha)	Gap	Total Area Require (Ha)	Gap	Total Area Require (Ha)
2	Collage					Demand	Gap	Demand	Gap	Demand	Gap							
3		College	26	0	1.25 Lakh	12	0	16	0	31	5	5 Ha	0	0	0	0	5	25
4		University Campus	9	0	1.25 Lakh	12	3	16	4	31	15	10 to 60 Ha	3	30	4	40	15	150
5		ITI's/Vocational Training	18	0	1 Lakh	15	0	20	2	39	19	4 Ha	0	0	2	8	19	76
6		Polytechnic	4	0	10 Lakh	1	0	2	0	4	0	4 Ha	0	4	0	0	0	0
7		Engineering College	20	0	1 Lakh	15	0	20	0	39	19	6 Ha	0	0	0	0	19	114
8		Medical College	4	7	1 Lakh	15	11	20	4	39	19	15 Ha	11	165	4	60	19	285
9		Other Professional Colleges	9	0	10 Lakh	1	0	2	0	4	0	2 Ha	0	0	0	0	0	0
10		Nursing and Paramedical Institute	19	0	10 Lakh	1	0	2	0	4	0	2000 sqm	0	0	0	0	0	0

(Source: Compiled by Consultant)

7.2.2.3 Summary of Educational Facilities Requirement

The demand of various Educational Facilities for the year 2045 is mentioned below in the table 7-38. The calculations are done based on URDPFI Guidelines

Table 7-40: Demand of Educational Facilities & Land Requirement for 2045

Sl. No.	Particular	Existing Number	Total Demand in 2045	Extended Future Demand	Future Land required in 2045 (Ha)
1	Pre-Primary, Nursery School	243	1546	1303	104
2	Primary School (Class I - V)	58	773	715	286
3	Senior Secondary School (VI - XII)	245	515	270	486
4	Integrated School without hostel facility (I - XII)	88	39	0	0
5	Integrated School with hostel facility (I - XII)	9	39	30	118
6	School for physically challenged	2	9	7	5
7	School for mentally challenged	1	4	3	1
8	College	26	31	5	25
8	University Campus	9	31	22	220
9	ITI's/Vocational Training	18	39	21	84
10	Polytechnic	4	4	0	0
11	Engineering College	20	39	19	114
12	Medical College	4	39	35	525
13	Other Professional Colleges	9	4	0	0
14	Nursing and Paramedical Institute	19	4	0	0
Total Area Requirement					**1968 Ha.**

(Source: Compiled by Consultant)

Based on the area requirement for each unit, land requirement for the above mentioned educationalfacilities is worked out. There will be a need of 1968 ha. of land for the above mentioned educational facilities.

7.2.3 Parks & Open Spaces

Guwahati is also a place having parks/areas and amusement parks of natural, semi-natural space for human enjoyment and recreation or for the protection of wildlife and natural habitats. Those areas are said to be unique park for adults as well as children of its kind.

i) Shraddhanjali kanan

ii) Dighalipukhuri

iii) Amusement park

iv) Nehru park

List of parks

In Guwahati, there are so many parks and open spaces, but some parks are under the GMDA'S and GMC's.

Table 7-41 Parks Developed by GMDA/GMC

Sl. No.	Name of Park and Location	Developing and Maintaining Authority
1	Nehru Park	GMDA
2	Shrraddhanjali Kanan	GMDA
3	Bastra Udyan, Sualkuchi	GMDA
4	Sankardev Udyan	Maintained by Lessee
5	Tarun Ram Phukan Park	Maintained by Lessee
6	Ambikagiri Udyan, Chandmari	Maintained by Park Development Society
7	Park at Sugam Path, Pubali Sangha	Maintained by Park Development Society

8	Children Park near Lalit Chandra Bharali College at Maligaon	Maintained by Park Development Society
9	Saraighat War Memorial Park at Agyathuri	GMDA
10	Chandra Kamal Baruah Park, Silsakoo, North Guwahati	GMDA
11	Kushal Konwar Park, North Guwahati	GMDA
12	Trailokya Sobhan Goswami Park, Mazgaon, North Guwahati	GMDA
13	Park at Nabin Nagar, Rajgarh	Maintained by Park Development Society
14	Children Park at Ananda Nagar, Christian Basti	Maintained by Park Development Society
15	Kamala Kanta Baruah Children Park, near s K Baruah Byelane -3, Rukminigaon	Maintained by Park Development Society
16	Children Park at Ajanta Path, Beltola	Maintained by Park Development Society
17	Park at Panjabari	Maintained by Park Development Society
18	Park t Bagharbari	Maintained by Park Development Society
19	Silpukhuri Tank Premises, Silpukhuri	Maintained by Park Development Society
20	Children Park at Kharguli	Maintained by Park Development Society
21	Simanta Sankardev Shishu Udyan, RGB Road, Sugam Path Byelane	Maintained by Pubali Sangha

(Source: GMDA, GMC)

Table 7-42 Parks Developed by GMC

Sl. No.	Name and Location of Park	Developing and Maintaining Authority
22	Sati Radhika Shanti Udyan	ATDC
23	Dighalipukhuri War Memorial	--
24	Bishnu Rabha Udyan, Pub Suraj Nagar Path, Kahilipara	--
25	Udayachal Sishu Udyan, GMCH Road	--
26	Jurpukhuri near Ugratara Mandir	Development in progress under AMRUT
27	Jurpukhuri (other pond)	Development in progress under AMRUT
28	Pratima Pandey Memorial Park, Chandmari	AASU
29	Rupeswar Bujarbaruah Shishu Udyan-I, Sundarpur	--
30	Rupeswar Bujarbaruah Shishu Udyan-II, Sundarpur	--
31	Rajohuwa Udyan, RGB Road near Manik Nagar	--
32	Laxmi Priya Devi Baruani Park, Narikalbasti	Park Development Society
33	ASEB Colony Park, Forest Gate	--
34	Refinery Sector-I Park, Noonmati	--
35	Refinery Sector-II Park, Noonmati	--

36	Refinery Sector-III Park, Noonmati	--
37	Dwarka Nagar Sishu Udyan, Udayan Path, Mathura Nagar	--
38	Swahid Park, Fatasil Ambari, near RG Baruah College	Development in progress under AMRUT
39	Sukreswar Ghat, Panbazar	ATDC
40	Mahavir Udyan Park, Fancy Bazar	--
41	Nalinibala Devi Park, Paltan Bazar	Development in progress under AMRUT

(Source: GMDA, GMC)

Table 7-43 Parks under Development

Sl. No.	Upcoming Parks	Developing Authority
1	Botanical Garden, Jail Road	GMDA
2	Adabari Park	GMDA
3	Hengrabari	GMDA

*(**Note**: ATDC: Assam Tourism Development Corporation, AASU: All Assam Student's Union, AMRUT: Atal Mission for Rejuvenation and Urban Transformation)* *(Source: GMDA)*

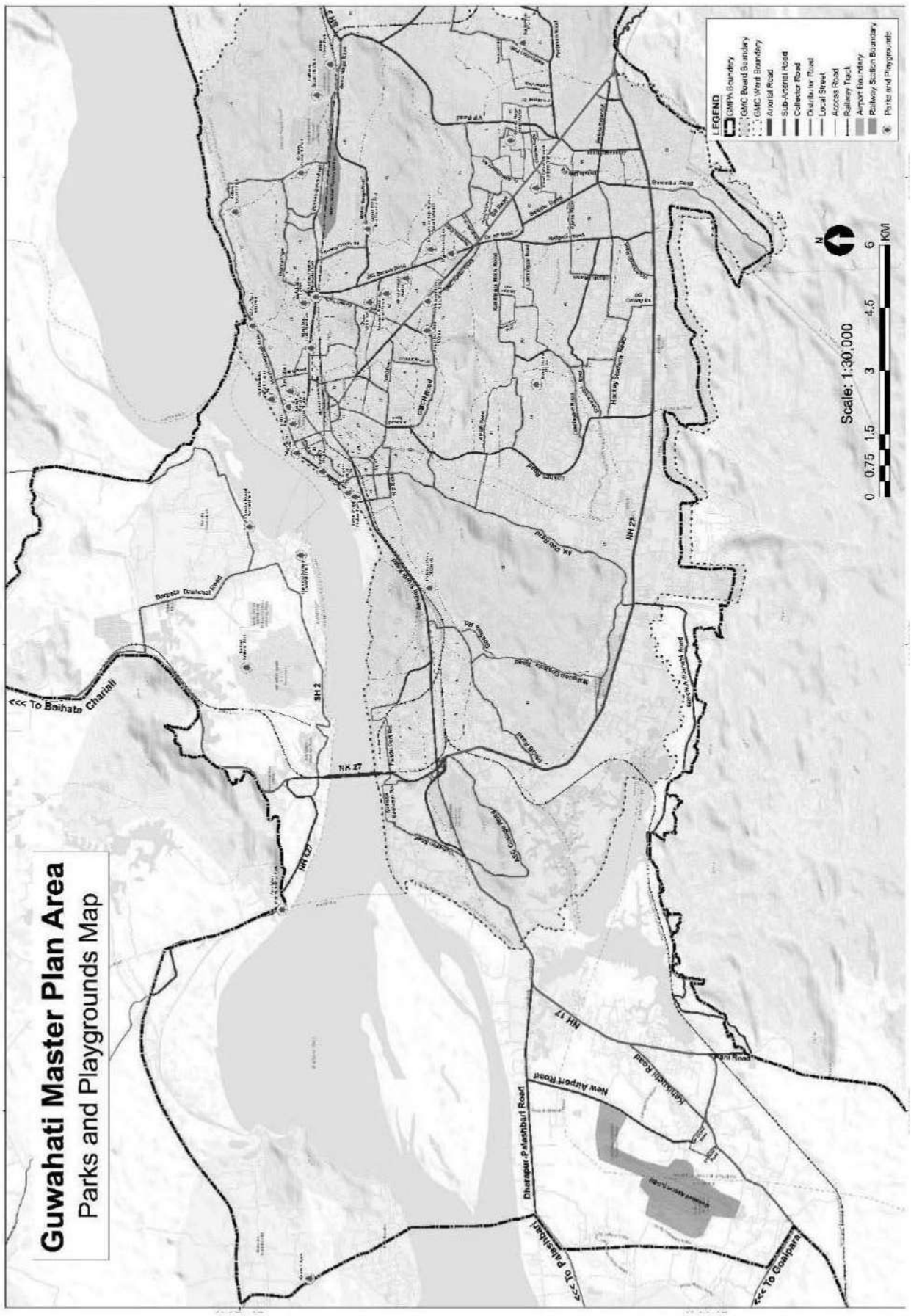


Figure 7-35: Parks and Playground Location in Guwahati

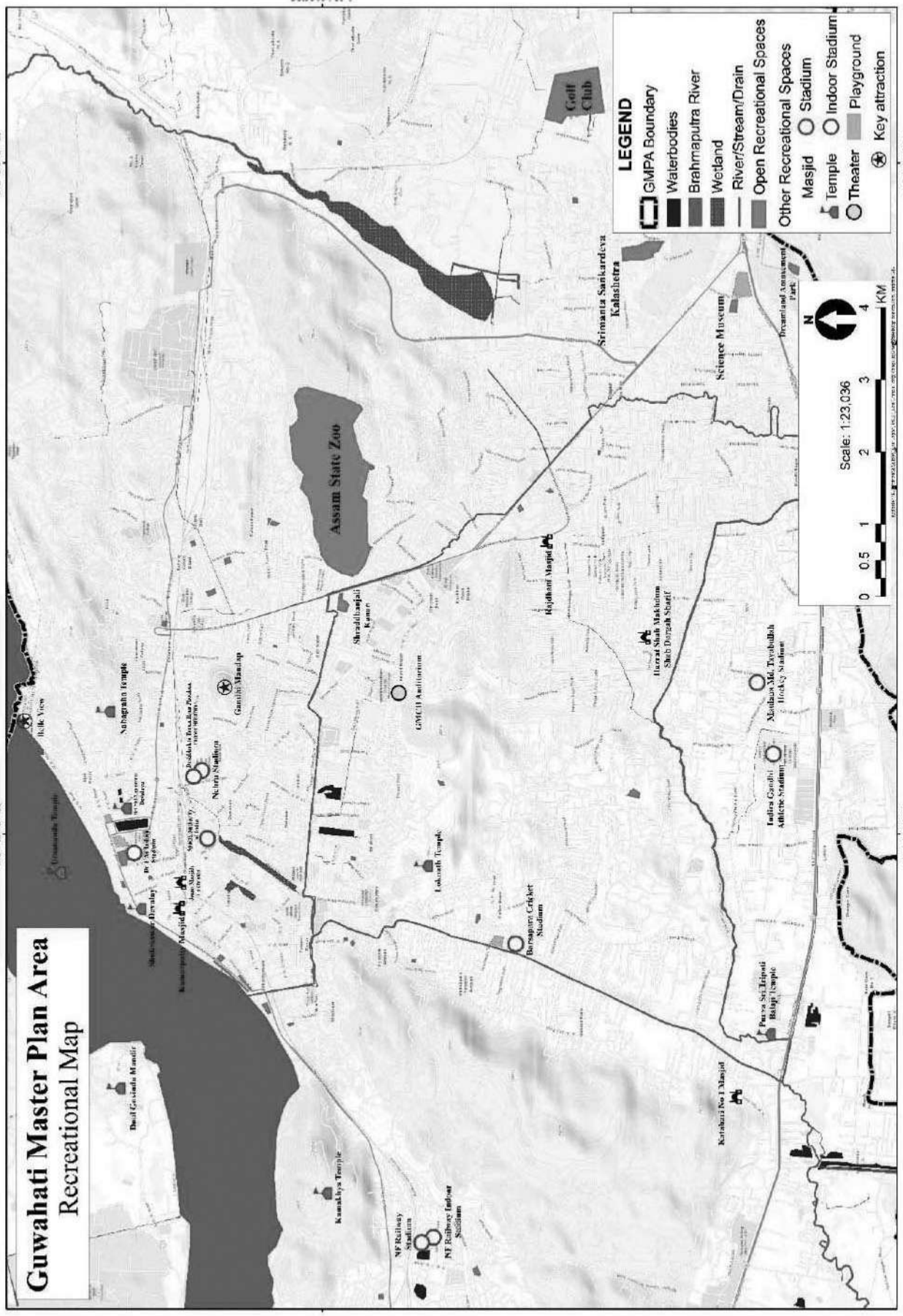


Figure 7-36: Recreational Place locations in Guwahati

Table 7-44: Existing and Future Assessment of Open Spaces

Category	Population served per unit	Area Requirement (Ha)	Requirement (2021)	Existing	Future Requirement (2045)	Extended Future Demand	Future Required Area
Housing Area Park	5000	0.50 to 1.00	295	41	773	732	366 to 732 ha
Neighbourh-ood park	10000	1.20 to 2.00	148	41	386	345	414 to 690
City Parks/ playgrounds / maidan/exhibition grounds/ cultural gathering grounds	1 for every town	--	-	4	- -		-
Botanical Garden	1 for every town	10.00 to 20.00	-	5	-		-
Recreational complex including zoo	1 for every settlement with tourist potential	10.00 to 12.00	-	1	-		-

(Source: Compiled by Consultant)

7.2.4 Fire Services

The data related to fire services in GMA are obtained from the Director, State Fire Services Organization, Assam. There are a total of 7 nos. of Fire Stations in GMDA including North Guwahati fire Station. Out of seven Fire Stations, four are regular Fire Stations i.e., Guwahati Fire Station (in between Panbazar and Paltan bazar), Dispur, Chand Mari, Lakhra and Pandu, and 2 nos. of Adhoc Fire Stations at Shantipur and North Guwahati.

7.2.4.1 Staff and Appliances

The following table provides the list of staff in each fire station and the number of different fire prevention appliances possessed by each.

Table 7-45: List of Staff in the different Fire Stations of Guwahati

Sl. No	Name of the Fire Station	Sanctioned Strength	Actual Strength
1	Guwahati F.S.	47	47
2	Dispur F.S.	45	45
3	Chandmari F.S.	21	21
4	Pandu F.S.	19	19
5	Lakhara	21	21
6	Sonapur F.S.	12	12
7	Chandrapur	15	15

(Source: Director, State Fire Service Organisation,2019-20, Assam)

Table 7-46: List of Appliances in the different Fire Stations of Guwahati

Sl. No	Name of the Fire Station	Water Tender Pump	Foam Tender Pump	Mini Water Tender Pump
1	Guwahati F.S.	2	2	2
2	Dispur F.S.	1	2	3
3	Chandmari F.S.	2	-	3
4	Pandu F.S.	2	-	1
5	Sonapur F.S.	1	-	1
6	Chandrapur F.S.	1	-	1

(Source: Director, State Fire Service Organisation,2019-20, Assam)

7.2.4.2 Water Reservoirs and other sources of water

Two water reservoirs have been constructed at Guwahati Fire Station having capacity of 1,00,000 litre each. One water reservoir has been provided at Dispur Fire Station having capacity of 1,00,000 litre. One pond is available at Pandu Fire Station.

The other sources of water for firefighting are ponds situated at Dighali Pukhuri, Jorpukhuri, Nagkata Pukhuri, Silpukhuri and pond of Meen Bhawan etc. but these are

not in a planned way for firefighting purposes because fire fighting vehicle cannot approach up to the pond for suction of water at the time of need.

7.2.4.3 Land Availability

Out of the 6 Fire Stations, only 2 Fire Stations like Guwahati Fire Station and Dispur Fire Station have been accommodated in their own premises and the building of Pandu Fire Station is being constructed at the same place. The other Fire Stations are accommodated in rented premises. Guwahati Fire Station and Dispur Fire Station are also having limited Quarter facilities for their staff.

7.2.5 Postal Services

The Guwahati City has a network of 48 post offices – a post office on average serving 5 Km. Guwahati has been linked with the National Capital Delhi under Rajdhani Channel. Here are 24 Yellow Letter Boxes in the city for posting of Rajdhani mails. Green and Blue letterboxes have also been installed at prominent locations. There are a total of 212 post boxes in the city.

The speed post service was introduced in Guwahati in 1986. At present there are 26 post offices with Speed Post Services.

Table 7-47 Post Offices in Guwahati

Post Office	Number
Delivery Post Offices	2
Delivery Sub Post Offices	36
Non Delivery Post Offices	10
Branch Post Offices	4

(Source: Guwahati City Postal Directory, Chief Postmaster General, Assam Circle)

7.2.6 Telecommunications Services

According to the data received from the General Manager, Kamrup Telephones, Guwahati, there are 20 exchanges in the Guwahati SDCA and 6 exchanges in DLC. The total capacity of all the exchanges is 134,610 out of which 105,541 connections are provided– the details being provided as under:

Table 7-48 Telephone Exchanges and their capacities in Guwahati

Sl No	Name of Exchange	Type	Capacity	Direct Exchange Lines
	Guwahati SDCA (Short Distance Charging Area)			
1	Panbazar	E10B	18000	12038
2	Panbazaar	OCB	15000	14407
3	Ulubari A	RLU	6000	4059
	Ulubari B	RSU	9500	9271
4	Adabauri A	RLU	5000	3751
	Adabari B	RSU	5250	4426
5	Noonmati A	RLU	5000	3751
	Noonmati B	RSU	5000	4261
6	Kumarpara	RSU	2500	1502
7	Silpukhuri	RSU	5750	5408
8	Kalapahar	RSU	10000	8487
9	Satgaon	RSU	3250	2552
10	Satmile	RSU	1000	567
11	Dispur	OCB	14000	11341
12	Basistha	RSU	5250	4472
13	Panjabari	RSU	4500	3684
14	Zoo Road	RSU	4750	3597
15	Hatigarh	RSU	3000	1811
16	Kahilipara	RSU	3000	2090
17	Gorchuk	RSU	1000	716
18	Christian Basti	RSU	2500	2077
19	Hengrabari	RSU	1000	724
20	Jayanagar	RSU	1000	707
	Digital Line Connectors			
1	Natbama	DLC	480	148
2	Kharghuli	DLC	960	53
3	IIT/NGH	DLC	480	34
4	Amingaon	DLC	480	37
5	IOC (Noonmati)	DLC	480	117
6	Ulubari	DLC	480	146
	Total		**134610**	**105541**

(Source: Office of The General Manager Telecom, Kamrup Telephones)

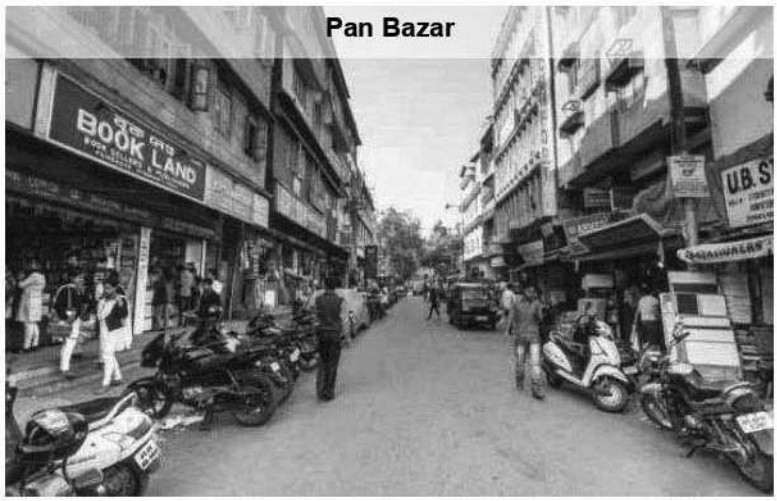
8. HERITAGE AND CULTURE

8.1 Heritage

8.1.1 Guwahati's Vintage Character

Guwahati is the biggest city of the Indian state of Assam and also the largest metropolis in northeastern India. The ancient cities of Pragjyotishpura and Durjaya (North Guwahati) were the capitals of the ancient state of Kamarupa. Many ancient Hindu temples like the Kamakhya Temple, Ugratara Temple, Basistha Temple, Doulgovinda and the Umananda Temple are situated in the city, giving it the title of "The City of Temples". The AHOM ERA Guwahati had localities with names such as Ketekibari and Barokheliya. The names of these area altered during the British colonial period, hence newer localities grew around them begun famous with the same names. Here's how these localities derived their names.

8.1.1.1 Pan Bazar



Pan Bazar

Previously this place known as Dhakaiptty, as most of the traders there had come from Dhaka, now the capital of Bangladesh. These Dhakaiyas or 'people from Dhaka' ran a few paan or betel leaf shops. In course of time, Panbazar or 'the market for paan' edged Dhakaipatty out. It was perhaps inevitable in an urban settlement that was once a 'betel nut market' or Guwahati. A Barnamghar named after Paan Joganiar Khel stands on the locality's Sarat Chandra Goswami Path. Boasting of educational institutes such as Cotton College, Cotton Collegiate School and Don Bosco School, Panbazar is the hub of quality education in Assam. It has the state's best known bookshops – oldest is Kitapghar – and publishing houses, the oldest sweet-shops like Gauhati Dairy, Mahamaya and Kalpana, Oldest bakery shaikh brothers and the first photoframing shop in the Northeast (Chitralaya, established 1918).

8.1.1.2 Lakhtokia

Lakhtokia is the stretch from Panbazar over-bridge to Sikh Temple. The area derived its name from the house of a man ancestor of Khasnur Ali – fabled to possess Rs 100,000 in cash. The house used to be referred to as lakhtokiar ghar or house of the man with Rs 1 lakh.


Lakhtokia Neighborhood

8.1.1.3 Fancy Bazar


Fancy Bazar

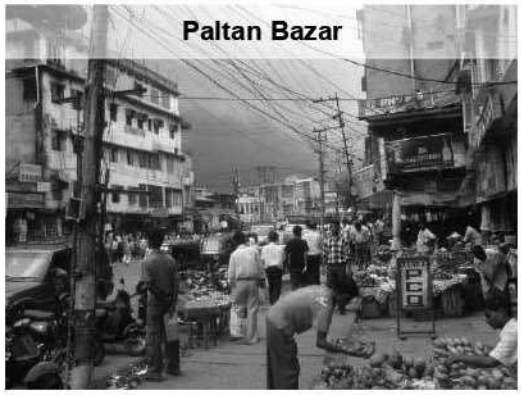
Known as Sudder Bazar during the early British rule until the jail was set up in 1882. Fancybazar, the commercial hub of Northeast India, derives its name from the British practice of hanging hardcore criminals from a huge tree around which the 45-bigha Guwahati Central Jail.The place get name after the practice of hanging (Fansi). Marwari traders who gave the market its name misspelt Fansi for Fancy. In course of time, Fancybazar expanded to encompass Sadar Bazar (Fancybazar ferry ghat) and Foidorgaon (near Sikh Temple where a Mughal army commander had settled down).

8.1.1.4 Uzan Bazar


Uzanbazar

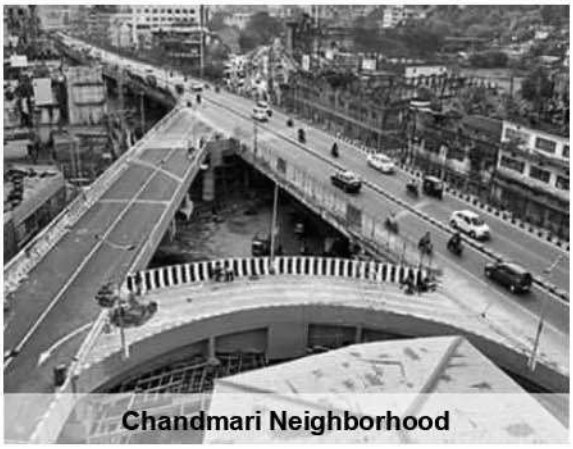
A market named Chowk Bazar flanked Latasil Field during the early British period. The market expanded toward uzan or upstream of the Brahmaputra, and it came to be known as Uzanbazar. Others contend that the area owes its name to the Naojan canal beside which it was located, and Naojan subsequently got condensed to Uzan. Naojan used to witness periodic maasor uzan or 'massive upstream movement of fishes'thus lending the locality its name. Another theory is that a large number of people from Ujani or Upper Assam settled there during the Burmese invasion (1817-1826), giving the area its name.

8.1.1.5 PaltanBazar


Paltan Bazar

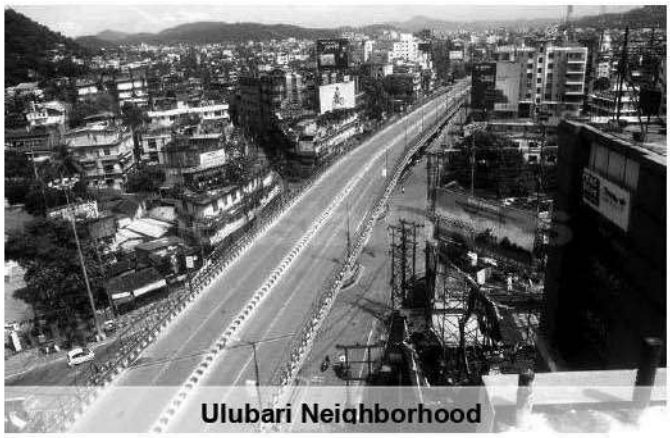
The first official army camp was set up in and around present-day Paltanbazar, the hub of transportation in Guwahati, during the British period. The camp used to accommodate a platoon or paltan of soldiers, and the bazar that came up around it known as Paltan Bazar.That time market caters the need of platoons.

8.1.1.6 Chandmari


Chandmari Neighborhood

An extended part of the old city's core area, Chandmari got its name from a shooting range that existed on the hillock where All India Radio station stands today. Chandmari, in Hindi, means the centre or bull's eye of a target for shooting. Earlier, the stretch from the east of Silpukhuri to Noonmati through Chandmari used to be called Joyduar Choki or Victory Gate.

8.1.1.7 Ulubari


Ulubari Neighborhood

Ulubari is an extension of the city's core area. The area was a mix of small canals, drains and arid wastelands but had a profusion of thatch grass or ulubon. As people began settling here, the ulubonor haabi (thatch grass jungle) came to be known as Ulubari. Rehabari, the adjunct locality that houses the headquarters of the Assam Police, got its name from riha (Boehmeria nivea), a medicinal plant that grew expansively there.

Soon after the dawn of the 20th century, Guwahati began expanding and localities such as Satribari, Kumarpara, Athgaon, Machkhowa, Bharalumukh, Santipur, Maligaon and Pandu came up. The last two were sired by the Northeast Frontier Railway in its earlier avatar as Assam Bengal Railway.

8.1.2 Buildings and Monuments

8.1.2.1 Old DC Bungalow


Old DC Bungalow

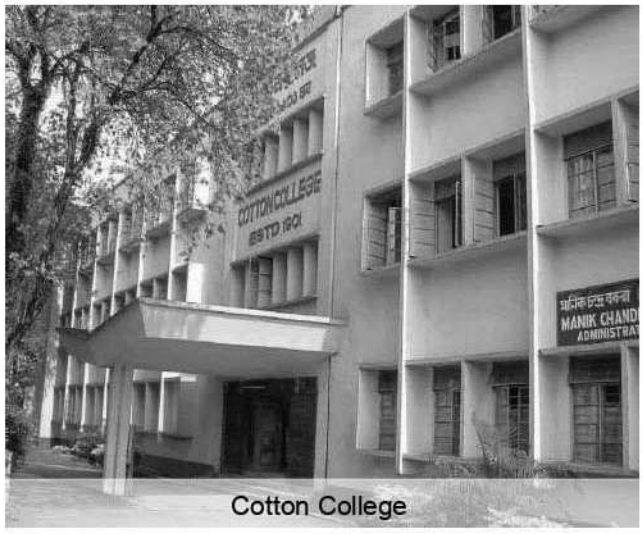
This British architecture bungalow is one of the oldest building made during colonial time by Britishers. The Bungalow is situated in the main administrative block of Guwahati. This building is more than 150 years old and undergo many renovations till date. Still the projects to upgrade and conserve this bungalow is going on. The record room is younger than its timeless neighbour, the Deputy Commissioner's bungalow. The post of DC was created for Guwahati in 1839. But the city had no pucca house at that time to accommodate first DC in Colonial times.

8.1.2.2 Mahefezkhana


Mahefezkhana

Mahefezkhana is also a old structure of colonial times.Mahafezkhana, near the Deputy Commissioner's bungalow, came up after 1855. With 20-inch-thick walls, it was one of two structures in the city that withstood the 1897 earthquake. The 86ft by 77ft Guwahati record room served as a ready archive, containing maps, administrative orders and all kinds of land records. Mahafezkhana continues to function though other structures around it were dismantled.

8.1.2.3 Cotton College



Cotton College

This building is 187 year old, the conservation work was carried by The Indian National Trust for Art and Cultural Heritage (Intach). Cotton College is among 19 institutions of the country granted "heritage" status by the University Grants Commission. As part of its move to conserve the

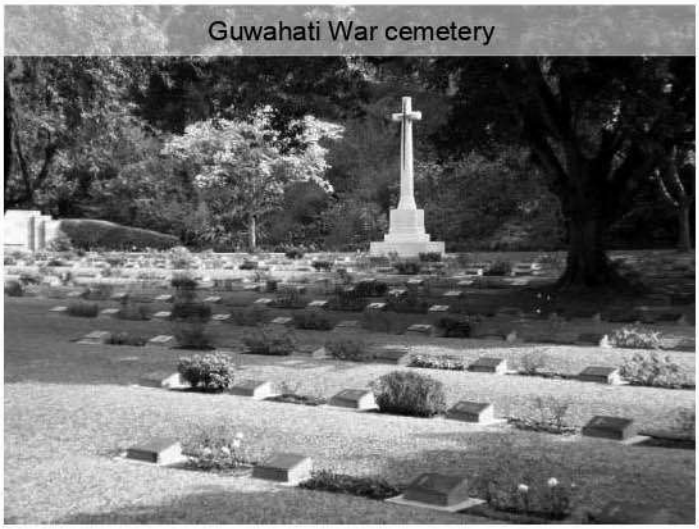
college campuses which are more than 100 years old, the UGC has approved varied financial assistance for the improvement and upgradation of these colleges. Under public demand, Manick Chandra wrote a letter in 1899 to the British government to open a college in Guwahati, as Assam was the only province without a college and Guwahati was most convenient for the people. In response, Sir Henry Stedman Cotton, K.C.S.I., the then Chief Commissioner of Assam, announced on 3 November 1899 that a college would be opened in Guwahati. The name decided by the public, the Cotton College, was inaugurated on 27 May 1901 by Cotton himself. It was affiliated to the Calcutta University. The college was started with five professors, which included Frederick William Sudmerson, the first principal of the college, and 39 students.

8.1.2.4 Assam State Museum

Central Conservation Laboratory located at Assam State Museum campus. It was established on 26th June, 1984. This is the first Conservation Laboratory of North East Region. Since then the conservation Laboratory is involved in the preservation and restoration of objects like stone, manuscripts, metallic objects, terracotta coins, textile, ethnography, wooden objects and paintings. Nearly 2000 objects have been preserved scientifically. Conservation services are also offered to private Museums, Satra Museums, Satras and N.G.O's within and out side the state. The Assam State Museum was founded by the Kamrupa Anusandhan Samity and was opened on 21st April, 1940 by Sir Robert Reid, the then Governor of Undivided Assam. The Provincial Museum was taken over by the Govt. of Assam in 1953 and placed under the Museums and Archaeology of the Education Department. Subsequently, for systematic and efficient management two separate entities i.e. Directorate of Museums and Archaeology was made in 1983.

Assam State Museum

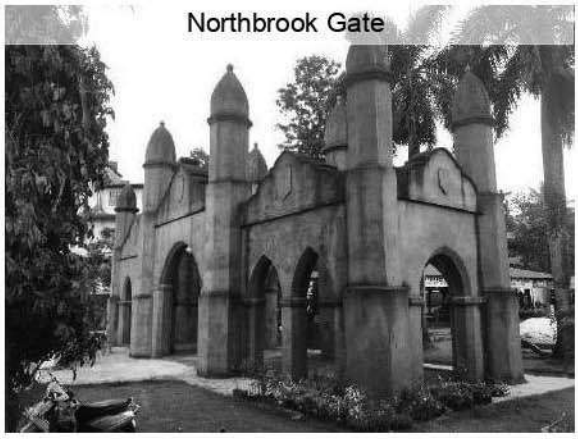
8.1.2.5 Guwahati War Cemetery


Guwahati War cemetery

At a distance of 2.5 km from Guwahati Railway Station, Guwahati War Cemetery is a cemetery located in the Silpukhuri area of Guwahati, Assam. Situated on Navagraha Road, it is one of the must visit places in Guwahati and among the historical places to visit in Assam.

The Cemetery was started during the Second World War for burials from the several military hospitals posted in the area. Later, other graves were brought in by the Army Graves Service. There are now 486 Commonwealth servicemen of the Second World War buried or commemorated in this cemetery. Of these, 25 burials are unidentified. The cemetery also contains 24 Chinese war graves, and two non-war graves. The cemetery is maintained by the Commonwealth War Graves Commission with its head office in the UK.

8.1.2.6 Northbrook Gate


Northbrook Gate

The Northbrook Gate was constructed to welcome British viceroy Lord Northbrook who visited Guwahati in 1874. The gate was built near Sukreswar Ghat where the viceroy anchored his ship. It is the only monument of its kind in this part of Assam and the lone surviving brick architecture from colonial times. For the last 140 years, it has remained a silent spectator of many developments of Guwahati. British government had decided that the gate would be designed after the famous King's College Chapel arches of England. The rectangular structure has a total of 12 arches, five each in the two longer sides and one in each side of its breadth. The gate was built of brick and white limestone. The structure was enhanced by the simplicity of design and the unusual lack of decorative carving of the arches. The unique aspect of the gate is that while the arches are of gothic design, the spires on the gate are

inspired by Indian temple designs - so the overall impression is of an Indo-gothic architecture.

8.1.2.7 Chief Justice Bungalow


Chief Justice Bungalow

Over the years, the bungalow underwent several changes but its basic wooden structure remains. An iron chest with the royal insignia, Belgian glass and furniture made of Burmese teak continue to adorn the master bedroom of the bungalow. The GMDA has, based on a master plan for Brahmaputra Riverfront Development, proposed to transform the DC's residence into a Handicraft Museum for the Northeast with landscaping. The Authority has received an approval of Rs 7.47crore for this project.

8.1.2.8 Guwahati Club


Guwahati Club

The European Club of Gauhati, established on 21 December 1894,was no difference. The club came up where the High Court judges' bungalows stand. It ensured fun for the members who played bridge, billiards, snooker, table tennis, badminton and lawn tennis every day and organised cultural evenings and fancy dress competitions occasionally. The club also had other ieausre actvity like fihing boats. The club was once burnt down in 1907 but later it again built by britishers.

8.1.3 ASI Sites

8.1.3.1 Manikarneshwar

Kalabhairava sculpture in inverted position due to tectonic activities.

This unique star-shaped Shiva temple on a hillock at Rajaduar is one of the oldest built by the Pala dynasty in the 11th century. The Ahom temple of 18th century at Manikarneswar hill is protected by the Directorate of Archaeology, Govt. of Assam. As per the cultural notice board displayed in the temple premise, this brick built temple was raised in the reign of Rajeswar Singha in 1755 CE upon a star shaped ground plan of a stone temple of 10th–11th century CE. P.C. Sarma (1988) describes that the complete scheming of the Manikarnesvara temple is based on a triangle. The plinth which is made of block-stone and retains its early medieval features is designed in the form of a star with six projections and it developed out of two concentric triangles. There are four major rock-cut images sculpted on low relief lying just on the foothill of Manikarneswar hill on the northern bank of river Brahmaputra. *(Sources: Archaeological Remains of Rajaduar Area in North Guwahati, Assam, Y.S. Sanathana, Manjil Hazarika)*

8.1.3.2 Aswakalanta Temple

Aswakalanta Temple

The place was named after Aswa-Klanta. Aswa means 'Horse' and Klanta means 'Tired' in Assamese. Formally there was a Kunda, a place of sacrifice near the temple. Now this Kunda does not exist because it was eroded by the river Brahamputra. Inside the temple, there are two images one of Janardana and the other of Anantasai Vishnu. The later is a fine art specimen of eleventh century. There is one stone inscription on the body of the temple. The location of the Aswaklanta temple holds great importance as many legends surround the existence of the temple.

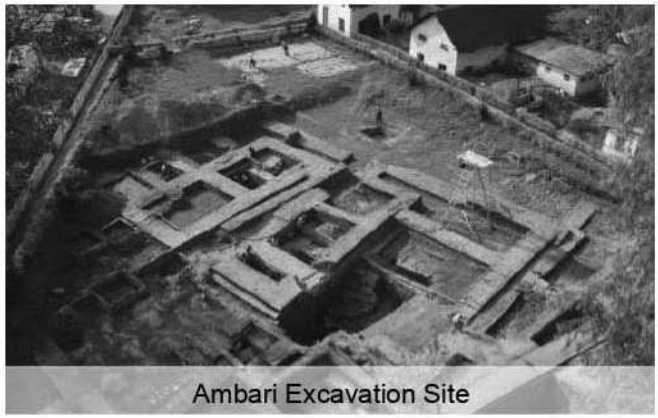
8.1.3.3 Umananda Temple


Umananda Temple

The temple of Umanada was built in Kamarupa style with a red colored dome. One has to descend a few steps to see the Lord as the sanctum is at a deeper level. The passage to the sanctum is very narrow and every time five to six devotees are allowed to climb down the steps. Inside the sanctum a tiny Shiva Ling is seen with a pedestal on the ground level. This temple was built by the Ahom king gadadhara Singha(1681-1696) who was a devotee of Shiva. During the massive earthquakle (8.1 scale) in 1897, the temple was damaged. Later a local merchant renovated the temple and inscribed the interior part of the temple with Vaishnavite slogans. The sculptures of Ganesha, Shiva and Devi (with a scorpion as an emblem) are carved on the rocky walls of the temple showing the architectural skills of the local sculptors.

8.1.3.4 Ambari Excavation Site

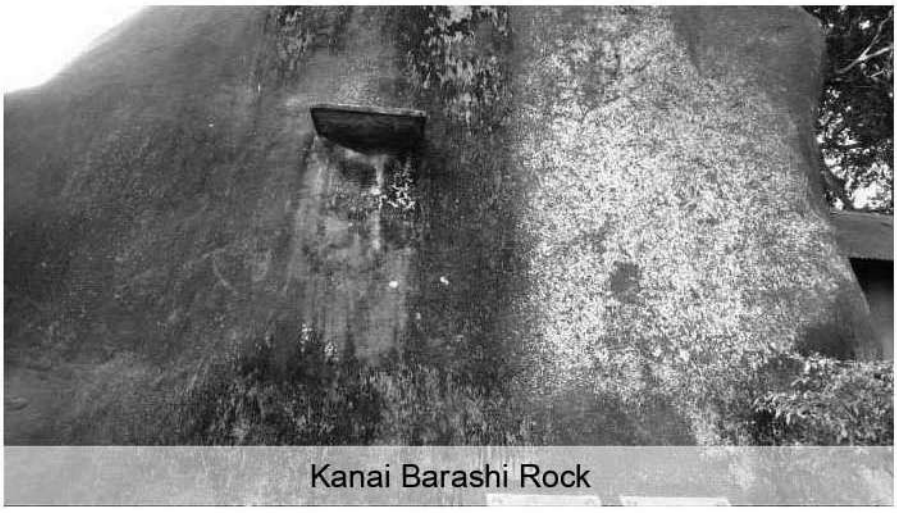
The Ambari Archaeological Site, situated in the heart of the Guwahati city in Kamrup District of Assam was accidentally discovered in course of digging the foundation for the building of the Reserve Bank of India in 1969. From 1970 to 2003 the site was excavated by different excavators. The occupation of Ambari has been made into two distinct cultural periods ranging from c. 7th to 12th c. AD and 13th to 17th c. AD respectively. The excavation at Ambari Archaeological Site in 2008-09 jointly by the Guwahati Circle of ASI and the Directorate of Archaeology, Assam is important and significantly rewarding in view of the fact that no cultural findings of the Sunga-Kushana period (2nd-1st c. BC to 3rd c. AD) were ever excavated in Northeast India prior to this excavation.


Ambari Excavation Site

8.1.3.5 Kanai Barashi Rock

Inscription 1 for Kanai Barashi Rock

The 'Kanai Barashi' Rock Incription site is located about 25 kilometer away from the Guwahati University. The site lies on a low hillock on the bank of the river Brahmaputra with scattered pieces of boulders and a large block of rock surrounded by other smaller blocks. This area appears to be of significant strategic importance as is revealed by three important rock inscriptions all relating to military victories of regional powers over foreign invaders that attacked Assam from the west. While Rock Inscription No.1 belongs to 1206 CE, Rock Inscriptions Nos. 2 and 3 were issued in 1665 CE. Rock Inscription 1.This inscription records the destruction of the Turks who invaded Kamrupa in 1206 A.D.


Kanai Barashi Rock

Muhammad-Ibn-Bakhtiyar Khilji an intrepid and bold Turko-Afghan leader after conquering Bihar and Bengal invaded Assam with an Army of 12,000 horsemen in 1206. In Bihar he had destroyed the World famous Nalanda University and burnt its Library. The petroglyphic engravings consist of labyrinth, chessboard, circle, animal like figure, man, man riding animal, circle in a square, linear markings, circle, demon, lady, indeterminate objects etc. Fine grained granite are found to be protruded out of the alluvial soil cover in the area. These fine grained granite had been used for engraving rock arts and inscriptions.

8.2 Culture of Guwahati

Guwahati is the meeting ground of diverse cultures. Guwahati is the gateway of Northeast, it consists of variety of communities and cultres within itself. The Guwahati culture is a rich and exotic tapestry of all these races evolved through a long assimilative process.The Assam state has a large number of tribes, each unique in its tradition, culture, dress and exotic way of life which we can witness in Guwahati.

Diverse tribes like Boro, Kachari, Karbi, Miri, Mishimi, Rabha, etc co-exist in Guwahati; most tribes have their own languages though Assmamese is the principal language of the state. A majority of the Assamese are Vaishnavas (a sect of Hinduism). The Vaishnavas do not believe in idol worshiping and perform "Naamkirtana", where the glory of Lord Vishnu is recited. The two important cultural and religious institutions that influence the cultural fabric of Guwahati, apart from diversed religious institutes the major one are the "Satras", the site of religious and cultural practice which have been in existence for over 400 years and the "Naamghar", the house of prayers. Villagers generally associate on the basis of membership of a local Centre of devotional worship called "Naamghar". Villages are usually made up of families from a number of distinct castes.

The state festival of Guwahati is the Bihu which is celebrated in three parts during a year with great pomp and grandeur, irrespective of caste, creed or religion. There are various elements which are being used to represent beliefs, feelings, pride, identity, etc and are considered as important symbolic elements in Guwahati's culture. The quintessential symbols are the Asomiya"Gamucha", "Jaapi", "TamulPaan" and "Xorai". Traditional attire worn by women called the "Mekhela Chador" and Assamese jewlery also form an integral part of the Guwahati's culture and proudly reflect by locals.

Besides this diversity in communities, the major one are *Boro,Kachari,Karbi Miri,Mishimi,Rabha,Vaishnavas* and *Kosari* and the other are migrants outside from Assam like *Marwaris* .Other tribes liek Khasis, Deoris, Nagas which belongs to different state of Northeast are also a part of Guwahati cultture.

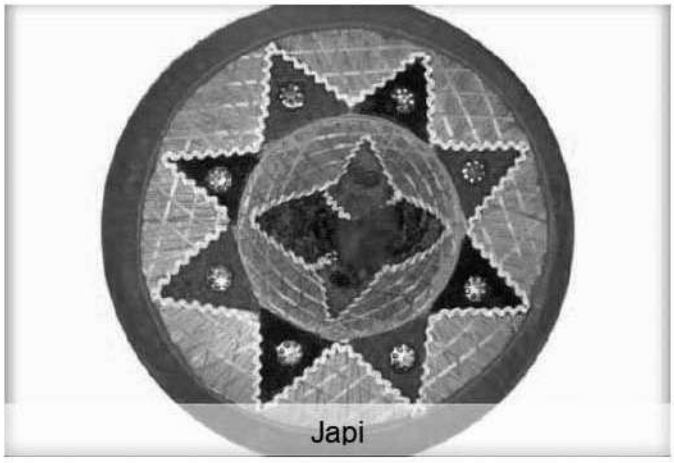
8.2.1 Art and Craft

8.2.2.1 Gamucha


Gamucha

The most recognizable and a symbol of Assam, which is integral part of socio-culture along with clothing attire. It is considered as an honorary piece of cloth commonly used for felicitation in Assam. The "*Gamucha"*, a white rectangular piece of cotton hand woven cloth with primarily a red border on three sides and red woven motifs on the fourth (in addition to red, other colors are also used) is put to many uses. It is used as a towel, as a waistcloth or a loincloth; a Bihu dancer wraps it around the head in a knot, it is also hung around the neck at the prayer hall and thrown over the shoulder to signify social status or respect. "*Gamucha"s"*, also known as "*Bihuwaans"*, are offered during Bihu as a token of love.

8.2.2.2 Japi


Japi

The "Jaapi" is a traditional conical hat from Assam which is made from tightly woven bamboo and/or cane and "Tokoupaat", a type of large palm leaf. The word "Jaapi"derives from Jaap meaning a bundle Tokou leaves. *Jaapi"* is worn in a style of Bihu dance, used as protection against the elements, offered as a sign of respect in ceremonies, and placed as a decorative item around the house, especially near the front door as a welcome sign. Plain "*Jaapi"* were used by farmers for protection from the sun and rain while working in the fields, while ornate "*Jaapi"* were worn as a status symbol by Assamese royalty and nobility.

8.2.2.3 Xorai


Xorai

Xorai" a traditional symbol of Assam, is a manufactured bell-metal product and is considered as an article of great respect by the people of Assam. There are "Xorai"s" with or without a cover on the top. Hajo and Sarthebari are the most important centers of traditional bell-metal and brass crafts in Assam. Xorai"s"are used to offer "Tamul Paan" as a sign of welcome and thanks for guests. It is also used as a utensil to offer Prasad, food and other items in front of the Lord in an altar or "Naamghar". "Xorai"s" are also used as decorative pieces and are also offered as a gift to a person of honour during felicitations.

8.2.2.4 Mekhela Chador


Mekhela Chador

Assam is the home of several types of silks, the most prominent and prestigious being "*Muga"*, the natural golden silk exclusive only to Assam. Apart from "*Muga"*, there are other two varieties called "*Paat*", a creamy-bright-silver coloured silk and "*Eri*", a variety used for manufacturing warm clothes for winter.Assam is the home of several types of silks, the most prominent and prestigious being "*Muga"*, the natural golden silk exclusive only to Assam. Apart from "*Muga"*, there are other two varieties called "*Paat*", a creamy-bright-silver coloured silk and "*Eri*", a variety used for manufacturing warm clothes for winter. Traditional Mekhela Chadors are made from Cotton, Muga, Paat Silk or Eri Silk. However, now a day"s some modern low-budget Mekhela Chadors are also made with varying blends of Cotton and Muga or Paat Silk with synthetic materials.

8.2.2.5 Assamese Jewellery


Assamese Jewellery

Assamese ornaments are one of the most important parts of Assamese culture. It is generally made of gold termed as "*Kesha Xoon*" or raw gold. The ornaments are very beautiful to look at and are a very prestigious part of Assamese culture. Some of the popular traditional Assamese jewlery include earrings with exquisite *Lokaparo, Keru, Thuriya, Jangphai, Long Keru, Sona* or *Makori*; an array of necklaces including *Golpata, Satsori, Joon biri, Bena, Gejera, Dholbiri, Doogdoogi, Biri Moni, Mukuta Moni, Poalmoni, Silikha Moni* and *Magardana*, and diversified rings including *Senpata, Horinsakua, Jethinejia, bakharpata* and others. The jewellery is typically hand-made, and the designs mostly depict flora and fauna treasures of the region. Traditional designs of Assamese jewellery are simple but decorated with vibrant red gemstone, ruby or mina. Black, red and green colours on gold jewellery look very gorgeous and these colours also dominate the traditional dresses of tribes and communities of the north-eastern states.

8.2.2 Dance, Music and Festivals

8.2.2.1 Bihu and Jhumur Dance


Bihu Dance

Bihu is the most popular folk dance of Assam. Bihu dances are performed by young boys and girls during the Bihu festivities which represent youthful passion, reproductive urge and joy. It is characterized by brisk dance steps and rapid hand movement. Dancers wear traditional colourful Assamese clothing. The dances are accompanied by musical instruments like "Dhol" (Dholak), pepa, gogana, banhi(flute) etc. Though the origin of the Bihu dance is unknown, the first official endorsement is cited to be when Ahom king Rudra Singha invited Bihu dancers

to perform at the Ranghar fields sometime around 1694 on the occasion of Rongali Bihu. Assam, being the home to many ethnic groups and different cultures, is rich in folk music. Traditional instruments include "Pepa", an instrument made from buffalo horn and "Bholuka baahor toka", a musical instrument made of split bamboo. The "Dhol" too is an important and a quintessential instrument used in Bihu dance. The "Dhol" is a double-sided barrel drum covered with goat, cow or buffalo skin and is played with a stick on one side and a handon the other. "Dhol" like instruments are found in almost every culture of the world, however, the Assamese "Dhol"or "PatiDhol" is distinguished by its small size and relatively produces a loud sound. These are extensively used in Bihu Geets, dances, and have also become a part of modern-day music. Bihu is a set of three important Assamese festivals in the Indian state of Assam Rongali or Bohag Bihu observed in April, Kongali or Kati Bihu observed in October, and Bhogali or Magh Bihu observed in January. The Rongali Bihu is the most important of the three, celebrating spring festival. The Bhogali Bihu or the Magh Bihu is a harvest festival, with community feasts. The Kongali Bihu or the Kati Bihu is the sombre, thrifty one reflecting a season of short supplies and is an animistic festival.

PatiDhol played during Bihu festivals

In the passage of more than a hundred years of their settlement in Assam the tea tribes have developed a synthesized form of dance called "Chah Baganar Jumur Nach". This is a beautiful dance to watch. A visitor to any tea garden can easily see this dance. The tea tribes have a synthesized form of dance called "Jhumur Nach", performed by girls and boys together, or, sometimes by the girls alone, with precision of footwork while tightly clasping each other's waist.

Jhumur Nach

8.2.3 Tribes and Their Cultures

8.2.3.1 Bodo Community

Bodo, group of peoples speaking Tibeto-Burman languages in the northeastern Indian states of Assam and Meghalaya and in Bangladesh. The Bodo are the largest minority group in Assam and are concentrated in the northern areas of the Brahmaputra River valley. Most of them are settled farmers, though they formerly practiced shifting cultivation. The Bodo consist of a large number of tribes. Boros are officially identified as "Boro, Borokachari" scheduled tribe under the constitution of India. Boros speak Boro language. The Boro people are recognised as a plains tribe in the Sixth Schedule of the Indian Constitution, and have special powers in the Bodoland Territorial Region, an autonomous division; and also as a minority people.

Community's Culture and Traditions

Bagurumba is a folk dance of indigenous Bodo tribe. It is a traditional dance which is traditionally inherent to one generation to another generations. The Bodo women perform the Bagurumba dance with their colourful dokhna, jwmgra (fasra) and aronai. The Bagurumba dance is accepted as main traditional dance of Bodo people. Among many different musical instruments, the Bodos use for Bagurumba Dance Sifung: This is a long bamboo flute having five holes rather than six as the north Indian Bansuri would have and is also much longer than it, producing a much lower tone.

Serja: a violin-like instrument. It has a round body and the scroll is bent forward.

kham : a long drum made of wood and goat skin.

Jota: made of iron/tama.

Gongwna: made of bamboo.

Bagurumba folk dance

Bagurumba folk music Sifung

8.2.3.2 Kachari Sonowal Community


Kachari Sonowal in their traditional attire

The Sonowal Kachari, an ethnic tribe from Assam, who are also known as Bhumiputras, have been dwelling in this area of Ancient Kamrupa,The Kachari Sonwal or Sonowal are an indigenous people who live in northeast India. They are a subgroup of the larger Kachari tribe. The name Sonwal comes from the word for gold. The traditional occupation of the Sonwal was panning for gold during the Ahom kingdom.

Today the Sonwal are primarily engaged in agriculture. They grow rice, betel nut, sweet potatoes and cotton. Betel nut is a mild stimulant chewed in social situations. Sonowal women are expert weavers of cotton and every young woman is given a handloom upon her marriage. The Sonowal also raise poultry and have cattle for dairy products. The Sonwal are believed to have a very rich traditional knowledge of indigenous medicine. There are some traditions, legends and folktales prevailed among the Sonowal Kacharis which indicate the origin of the people as a Kachari race; earlier have a kingdom at Sadiya.

Community's Culture and Traditions


Bohua Dance of Kachari Sonowal tribe

According to an ancient tradition, the earliest Kacharis of Sadiya came down from the northern mountains through snowy terrain and settled down in the foothills. The Bohua dance has ancient origins. It is known that Lord Shiva or Khring Raja Baithow is the main God of the Sonowal Kacharis. The Sonowal Kachari, an ethnic tribe from Assam has a distinctive style of food and diet. They mostly eat naturally available vegetables, roots, leaves, herbs, fruits, fish,animals and insects. These foods have preventive, therapeutic, and remedial medicinal values.

8.2.3.3 Karbi Community

Racially the Karbis belong to the Mongoloid group and linguistically they belong to the Tibeto-Burman group. The folk-lores of the Karbis, however, indicate that during the long past, once they used to live on the banks of the rivers the Kalang and the Kapili and the entire Kajiranga area, the famous National Park situated in Assam, was within their habitation. The Karbis have 5(five) clans called "KUR". These are Terang, Teron, Enghee. Ingti and Timung. Each of the five clans has a number of Sub-clans. While Enghee and Timung have 30(thirty) sub-clans each, Terang and Teron have 6(six) sub-clans each and the remaining clan Ingti has only 4(four) sub-clans.

Community's Culture and Traditions


Karbi community dance Hacha Kekan

Dance and Music play an important role in the life of the Karbi Society. Various types of dances are performed by the youths during the performances of Chomangkan, the death ceremony and other socio-religious festivals. Hacha Kekan, the dance performed at the harvesting festival. The Karbis have very limited number of musical instruments. A big drum called Cheng is their main musical instrument. It is generally played by a master drummer called Duihudi. They also use small drums called Chengbruk. They have two kinds of flutes, the wooden flute is called Muri and bamboo flute is called Pangche. In some of their dances they use war shield made of rhinocer's skin called Chong and prototype war sword called Nok.

Karbi youth festivals

8.2.3.4 Miri or Mising Community


Miri women in their traditional attire

The Mising were originally a hills tribe who inhabited the Abor and Mishimi hills in the state of Arunachal Pradesh. They migrated to the plain of Assam prior to the advent of Ahoms and settled in the riverside areas of the Bahmaputra and the Subansiri. The Mising are divided mainly in to two sections, The Hill Mising live in the hills and the Plain Mising live in the river bank. They are the indigenous people of the state. The constitution of India provides various political and economic safeguard to the tribal people. The Misings are called Miris by the plains people of Assam.

Community's Culture and Traditions


Gumrag dance of Miri tribe

The traditional chief festivals Ali Aye-Ligang and Po:rag are observed by the Mising. These festivals are connected with agriculture. This festival is celebrated on the first Wednesday of Fagun month which falls mostly in the month of February all over Assam. In earlier times although this festival is held at fagun month of Assam, no particular day is considered to celebrate. Their dance known as dance known as gumrag', with musical instrument of Dhol or drums', Pepa',Siphung'(flutes), cymbals' etc. and oinitom'(Mising song).Through such dance ,hunting, fishing, weaving acts are performed.

8.2.3.5 Rabha Community

Rabha, also, Rava, etc., are an indigenous Tibeto-Burman community of Nepal, Bhutan, Thailand, Myanmar, and Bangladesh, and the Indian states of Assam, Meghalaya and West Bengal. The language/dialect spoken by the Rabha people is mostly Rabha, a Tibeto-Burman language, as well as Assamese. In Assam, the Rabhas live mostly in Goalpara, Kamrup, Kokrajhar, Udalguri, and Baksa districts; and also in some places of Bongaigaon, Chirang, Sonitpur, and Karbi Anglong districts. Rabha is a generic name for a number of communities, which can be designated as

sub- tribes. From this point of view the Rabha comprises of eight socio-cultural and linguistic clans. Agriculture is the main occupation of the Rabha. During the off-seasons, some serve as day-labourers also. They undertake cultivation of both Ahu and Sali rice along with some amount of pulses, mustard seeds and jute.

Community's Culture and Traditions

Rice is the staple food of the Rabha with an inherent interest for dried and powdered fish, pork and rice-beer (Jhonga) is their favourite drink and is prepared on festive occasions. The women of the Rabha Tribe are greatly attracted to ornaments. They used ornaments as a marker of social status, personal status, signifier of some form of affiliation for belonging to ethnic, religious and social tribe, and also used in artistic display. The Baikho is the principal deity of the Rabhas which is associated with the crops; worshipped only once in a year with great ceremony during the month of April and May. The literacy meaning of Baikho is, "bai" means deity and "kho" means great. Hence, the name indicates a great deity. It is celebrated to propitiate the deity of wealth adored for her "ability to bring forth rains, abundant crops and health for the community." It takes place annually to ward off "evil spirits" through puja ahead of the spring harvest; during which time the community people offer animal sacrifices, play traditional music.

Rabha tribal dance during harvesting

Rabha tribal cousin during harvesting

8.2.3.6 Vaishnavas Community

Sankaradeva was a versatile genius, who has revolutionized the whole Assamese society. He laid the foundation of Assamese society. The neo- Vaishnavite movement of Sankaradeva ushered an era of wide culture comprising of music, dance and painting.These community have made their own litreture, Tales and Raga have their own dance style which depicts the Bhagvat geeta and its' teaching.

Community's Culture and Traditions


Sankari music

Srimanta Sankaradeva created a new classical school of music, known as Sankari music with his Bargeet. These Bargeet songs are one of the main modes of conveying the principles of the Ek Sarana Nama Dharma, founded by the saint. Sankari music is one of the three major classical schools of music in India, the other two being the Hindustani and Carnatic music. Srimanta Sankaradeva created twenty-five Raga for his Bargeet, a unique group of devotional songs. The Sattriya dance form was introduced in the 15th century A.D by the great Vaishnava saint and reformer of Guwahati, Mahapurusha Sankaradeva as a powerful medium for propagation of the Vaishnava faith. The dance form evolved and expanded as a distinctive style of dance later. This neo-Vaishnava treasure of Guwahatiese dance and drama has been, for centuries, nurtured and preserved with great commitment by the Sattras i.e., Vaishnava or monasteries.


Sattriya dance in Borduwa satra

8.3 Proposed Strategies

8.3.1 Heritage Management and Organizational Structure

There is a need to setup a Heritage Committee for Guwahati Panning Area. The concerned Development Authorities/municipalities as well as local stakeholders, NGOs have significant role to play in successful implementation of strategies proposed for Guwahati's Areas.

Formulations of special regulations to control or mediate development within the available heritage areas are a prerequisite for effective implementation of the proposed recommendations. Special regulations for all development within heritage areas, including new construction, demolition or modification to existing buildings around historic structures or within historic precincts must be formulated by the concerned authority with the advice of Heritage Committee.

Detail plans must be prepared by respective development Authorities and Municipalities. It is necessary to prepare an inventory of built, cultural and natural heritage resources of the special areas. The inventory must include both protected and unprotected resources. the cost for most of the new developments in special heritage areas is already covered in budget allocation for 'Tourism, Recreation and Culture' and hence not included in this table. Estimates for projects those are specific for preservation of heritage resources are only included.

8.3.2 Heritage Conservation Proposal

Figure 8-1 Heritage Conservation process

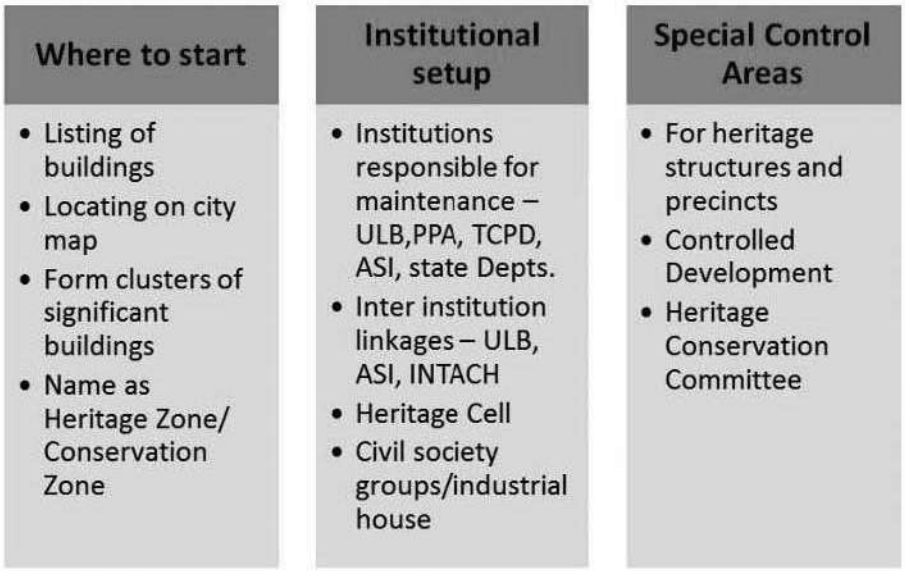


Figure 8-2 Heritage Conservation Chart

The primary objective of listing is to record extant architectural heritage and sites and the outcome of this process should invariably be to grade the heritage by a multidisciplinary team of experts whose recommendations should be available for public stakeholders and they can assess those for further changes if required. The importance of this process cannot be underestimated because its results determine subsequent conservation decisions and it facilitates the prioritisation of decisions relating to the future of architectural heritage and sites.

Listing does not prevent change of ownership or usage but change of use of such Listed Heritage Building / Listed Precincts is not permitted without the prior approval of the Heritage Conservation Committee. Listed Heritage Buildings / Listed Heritage Precincts may be graded into three categories. The definition of these and basic guidelines for development permissions are as follows:

Grade-I	Grade-II	Grade-III
(A) Definition: Heritage Grade-I comprises buildings and precincts of national or historic importance, embodying excellence in architectural style, design, technology and material usage and/or aesthetics; they may be associated with	Heritage Grade-II (A&B) comprises of buildings and precincts of regional or local importance possessing special architectural or aesthetic merit, or cultural or historical significance though of a lower scale than Heritage Grade-I. They are	Heritage Grade-III comprises building and precincts of importance for townscape; that evoke architectural, aesthetic, or sociological interest through not as much as in Heritage Grade-II. These contribute to determine the character of

a great historic event, personality, movement or institution. They have been and are the prime landmarks of the region. All-natural sites shall fall within Grade-I.	local landmarks, which contribute to the image and identity of the region. They may be the work of master craftsmen or may be models of proportion and ornamentation or designed to suit a particular climate.	the locality and can be representative of lifestyle of a particular community or region and may also be distinguished by setting, or special character of the façade and uniformity of height, width and scale.
(B) Objective: Heritage Grade-I richly deserves careful preservation.	Heritage Grade-II deserves intelligent conservation	Heritage Grade-II deserves intelligent conservation (though on a lesser scale than Grade-II and special protection to unique features and attributes).
(C) Scope for Changes: No interventions be permitted either on exterior or interior of the heritage building or natural features unless it is necessary in the interest of strengthening and prolonging the life of the buildings/or precincts or any part or features thereof. For this purpose, absolutely essential and minimum changes would be allowed and they must be in conformity with the original.	Grade-II(A) : Internal changes and adaptive re-use may by and large be allowed but subject to strict scrutiny. Care would be taken to ensure the conservation of all special aspects for which it is included in Heritage Grade-II. Grade-II (B) : In addition to the above, extension or additional building in the same plot or compound could in certain circumstances, be allowed provided that the extension / additional building is in harmony with (and does not detract from) the existing heritage building(s) or precincts especially in terms of height and façade	Not Requires

(D) Procedure: Development permission for the changes would be given on the advice of the Heritage Conservation Committee.	Development permission for the changes would be given on the advice of the Heritage Conservation Committee.	Development permission for changes would be given on the advice of the Heritage Conservation Committee.
(E) Vistas / Surrounding Development: All development in areas surrounding Heritage Grade-I shall be regulated and controlled, ensuring that it does not mar the grandeur of, or view from Heritage Grade-I.	All development in areas surrounding Heritage Grade-II shall be regulated and controlled, ensuring that it does not mar the grandeur of, or view from Heritage Grade-II	All development in areas surrounding Heritage Grade-III shall be regulated and controlled, ensuring that it does not mar the grandeur of, or view from Heritage Grade-III.

(Source: CPWD)

For the conservation of heritage buildings, the abovesaid steps are to be followed.

9. TOURISM

Tourism is a social and economic phenomenon that heavily influences contemporary society (Crick, 1996). Nowadays, tourism industry can be considered as business behaviour since it might influence the development of a local economic. The secret for a successful destination is to approach the right target market and to provide an appropriate combination of local tourism products and services.

Tourism is now-a-days considered as an important industry which has vast scope for the generation of income and employment. It is one of the world's fastest growing industries, a major source of foreign exchange earner of a nation and a measure for resolving interstate and inter community conflict.

9.1 Indian State's/UT's wise Tourists Inflow.

Assam Stands 22nd in the Tourism sector when compared with other states and UT's. But in case of North Eastern States, Assam stands 1st in the Tourism Sector.

Table 9-1 North-eastern States Wise Domestic Visitor Arrival in Assam (2005 - 2016)

Sl.no	State/UT	Domestic	Foreign
1	Uttar Pradesh	1161297774	3130437
2	Tamil Nadu	338635730	4703343
3	Andhra Pradesh	137377204	289809
4	Karnataka	124813271	549127
5	Madhya Pradesh	114233039	392280
6	Maharashtra	109959868	4539483
7	Telangana	94838573	146324
8	West Bengal	72326850	1509100
9	Gujarat	39270686	314363
10	Rajasthan	38341344	1494520
11	Jharkhand	33234408	168614
12	Punjab	32249844	451052
13	Uttarakhand	30001151	111494
14	Bihar	28272623	967134
15	Delhi	26859442	2449626
16	Himachal Pradesh	17561398	429439
17	Chhattisgarh	17431156	7807
18	Kerala	12819054	1007949
19	Odisha	12314442	71666
20	J & K	9279798	60888
21	Haryana	7389246	317205
22	**Assam**	**5326222**	**18703**

23	Goa	5203242	611082
24	Puducherry	1347741	111795
25	Chandigarh	1128173	30544
26	Daman &Din	808556	5764
27	Meghalaya	791026	8252
28	Sikkim	726183	52246
29	Dadra & Nagar Haveli	558428	1844
30	Arunachal Pradesh	368971	6152
31	Tripura	366895	35833
32	Andaman & Nicobar Island	340618	15070
33	Manipur	148404	3162
34	Mizoram	66922	870
35	Nagaland	61397	3015

(Source: State/Union Territory Tourism Department, Ministry of Tourism)

Table 9-2 State wise tourism flow of India

Sl.No	State/UT	2015		2016	
		Domestic	Foreign	Domestic	Foreign
1	Andaman & Nicobar Island	296684	14674	384552	15466
2	Andhra Pradesh	121591054	237854	153163354	341764
3	**Arunachal Pradesh**	**352067**	**5705**	**385875**	**6598**
4	**Assam**	**5491845**	**24720**	**5160599**	**12685**
5	Bihar	28029118	923737	28516127	1010531
6	Chandigarh	1073842	29538	1182504	31549
7	Chattisgarh	18327841	6394	16534471	9220
8	Dadra & Nagar Haveli	527782	1797	589074	1891
9	Daman &Din	790911	5858	826201	5669
10	Delhi	25258051	2379169	28460832	2520083
11	Goa	4756422	541480	5650061	680683
12	Gujarat	36288463	284973	42252909	343752
13	Haryana	7395496	303118	7382995	331291
14	Himachal Pradesh	17125045	406108	17997750	452770
15	Jharkhand	33079530	167785	33389286	169442
16	J & K	9145016	58568	9414579	63207
17	Karnataka	119863942	636502	129762600	461752
18	Kerala	12465571	977479	13172536	1038419
19	Lakshadweep	17241	1173	8716	853
20	Madhya Pradesh	77975738	421365	150490339	363195

21	Maharashtra*	103403934	4408916	116515801	4670049
22	**Manipur**	**146169**	**3260**	**150638**	**3064**
23	**Meghalaya**	**751165**	**8027**	**830887**	**8476**
24	**Mizoram**	**66605**	**798**	**67238**	**942**
25	**Nagaland**	**64616**	**2769**	**58178**	**3260**
26	Odisha	11786117	66971	12842766	76361
27	Puducherry	1297192	106153	1398289	117437
28	Punjab	25796361	242367	38703326	659736
29	Rajasthan	35187573	1475311	41495115	1513729
30	Sikkim	705023	38479	747343	66012
31	Tamil Nadu	333459047	4684707	343812413	4721978
32	Telangana	94516316	126078	95160830	166570
33	**Tripura**	**363172**	**34886**	**370618**	**36780**
34	Uttar Pradesh	204888457	3104062	2117707090	3156812
35	Uttarakhand	29496938	105882	30505363	117106
36	West Bengal	70193450	1489500	74460250	1528700
	Total	**1431973794**	**23326163**	**1613551505**	**24707732**

(Source: State/Union Territory Tourism Department, Ministry of Tourism)

9.1.1 Percentage of total tourists visited during year 2014-18

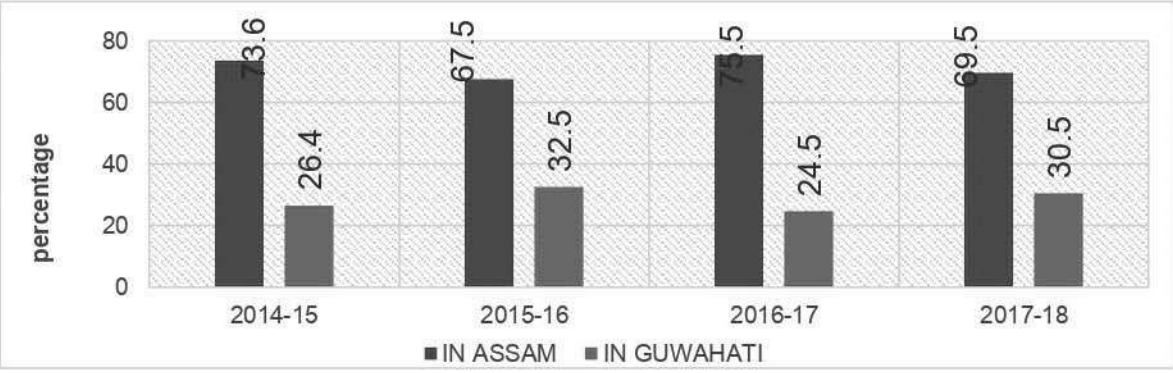


Figure 9-1 Percentage of Tourists visited in Assam and in Guwahati.

9.1.2 Percentage of domestic tourists visited

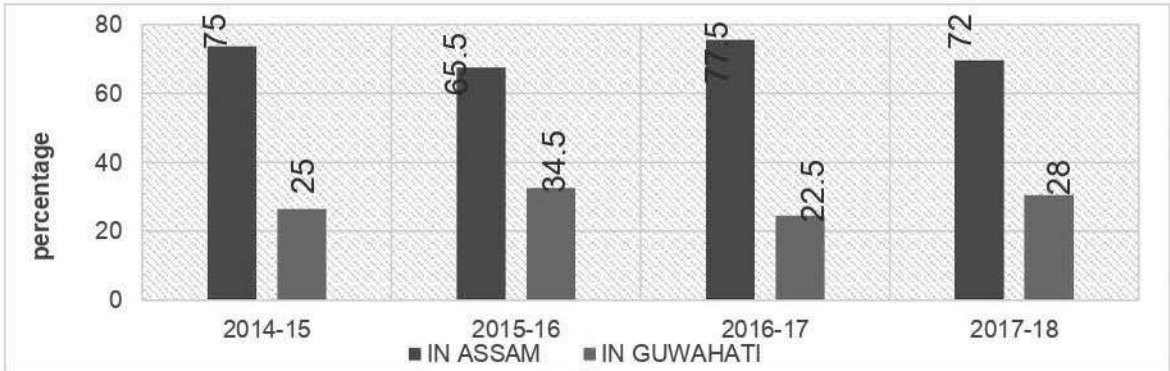


Figure 9-2 Percentage of domestic tourists visited

9.2 Overview of Tourism in the North East

The location of the region is strategically important as it shares its border with Bangladesh, Bhutan, China, and Myanmar. The natural beauty of the place, rivers and mountains, Buddhist monasteries, serene natural environment, exotic flora and fauna, unique tribal culture, folk dance and music in the North-Eastern region together offers an opportunity for development of tourism in the region.

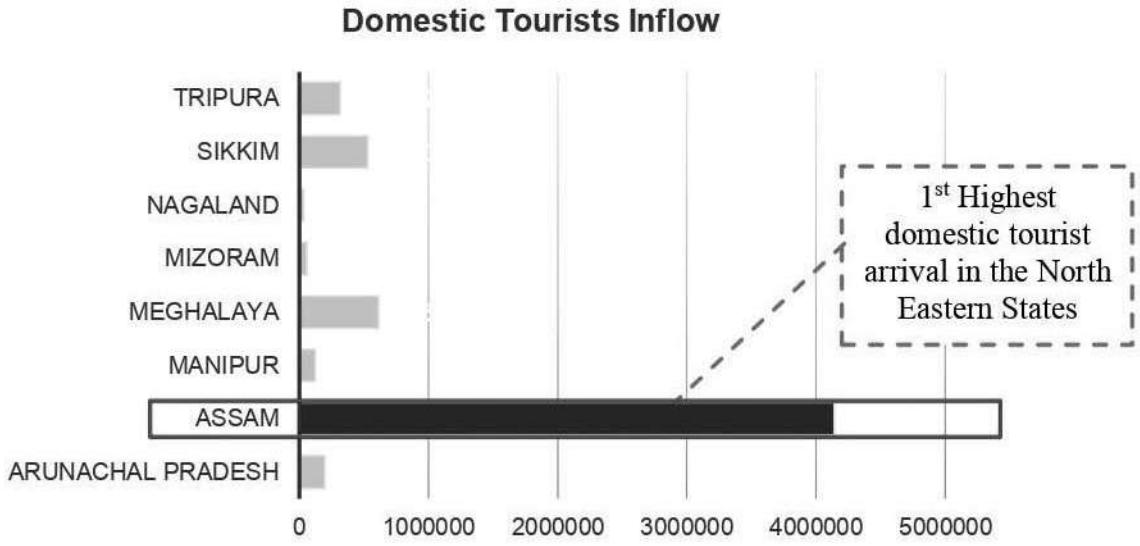


Figure 9-3 North-eastern States Wise Domestic Visitor Arrival in Assam (2005 - 2016)

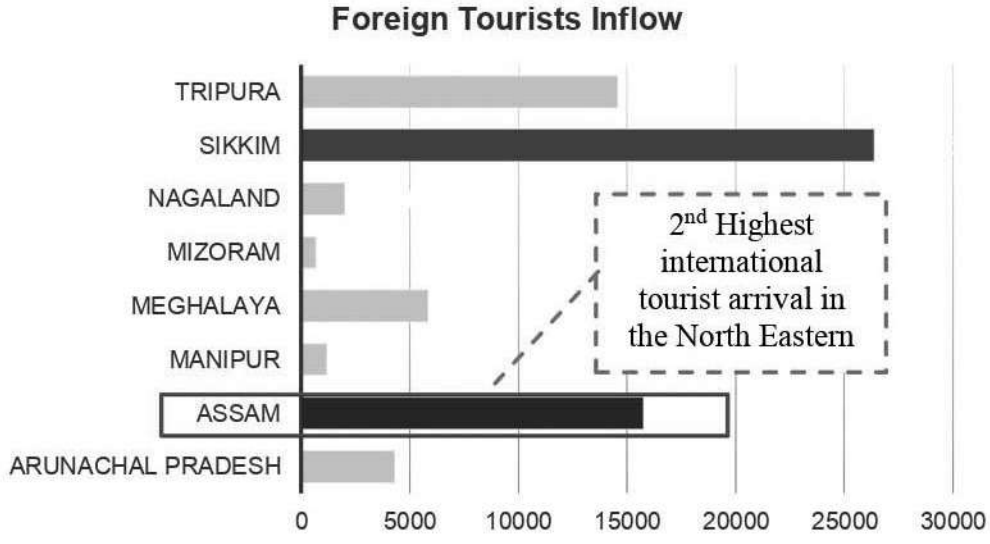
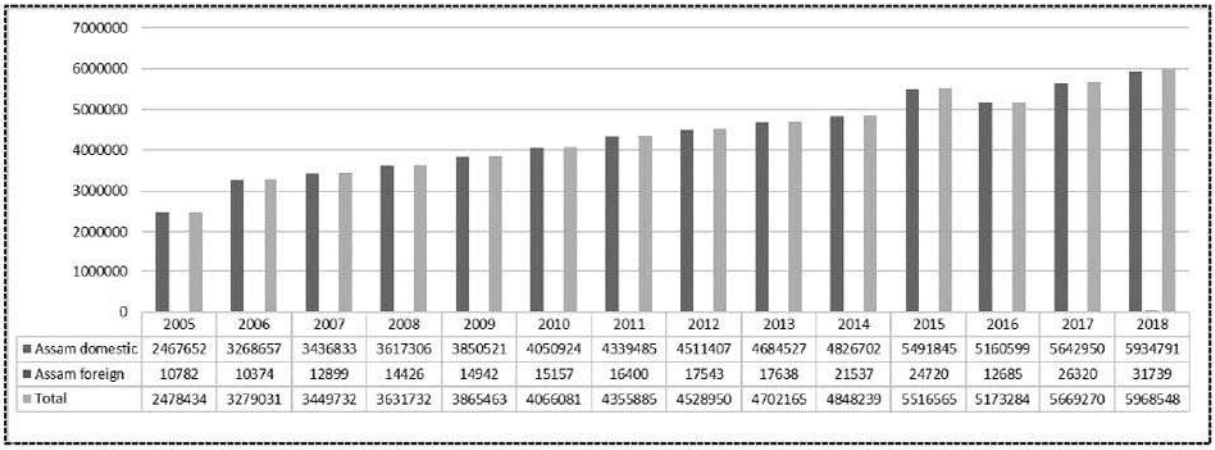


Figure 9-4 North-eastern States Wise Foreign Visitor Arrival in Assam (2005 - 2016)

(Source: State/Union Territory Tourism Department, Ministry of Tourism)

9.3 Assam State Tourists Inflow

The tourist in-flow of the Assam state shows that maximum tourist arrivals are the Domestic tourists and it clearly depicts that there is a growth in the Tourism Sector from 2005 – 2018. There is a huge scope for Tourism Industry in the Assam state.



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Assam domestic	2467652	3268657	3436833	3617306	3850521	4050924	4339485	4511407	4684527	4826702	5491845	5160599	5642950	5934791
Assam foreign	10782	10374	12899	14426	14942	15157	16400	17543	17638	21537	24720	12685	26320	31739
Total	2478434	3279031	3449732	3631732	3865463	4066081	4355885	4528950	4702165	4848239	5516565	5173284	5669270	5968548

Figure 9-5: Assam State Tourists Inflow (Source: State/Union Territory Tourism Department, Ministry of Tourism)

Year	Domestic Tourist	Foreign Tourist	Revenue
2014-15	**48,63,826**	**20,005**	Rs. 25,24,860/-
2015-16	**56,42,950**	**26,320**	Rs. 27,37,065/-
2016-17	**54,13,156**	**28,419**	Rs. 22,26,095
2017-18	**59,34,791**	**31,739**	Rs. 24,30, 267
2018-19 (Upto Jan 19)	**50,02,172**	**29725**	Rs. 29,89,144/-

(Source: State/Union Territory Tourism Department, Ministry of Tourism)

9.4 Assam Districts & Destination wise Tourists Inflow

Table 9-3 District wise tourists' inflow of Assam

Sr. No.	Name of the District	Domestic	Foreign	Total
1	Guwahati	607989	2202	610191
2	Tinsukia	123327	323	123650
3	Dibrugarh	115172	408	115580
4	Jorhat	97512	431	97942
5	Silchar	68183	127	68310
6	Tezpur	51093	234	51326
7	Dhubri	45170	55	45225
8	Subsagar	41961	188	42149
9	Kaziranga	34915	1789	36704
10	Barpeta	29366	91	29458
11	Lakhimpur	25841	12	25853
12	Goalpara	24325	48	24372
13	Golaghat	22182	7	22189

14	Nagaon	18252	21	18273
15	Dhemaji	5910	0	5910
16	Morigaon	4542	2	4544
17	Majuli	327	0	327
18	Hajo	282	10	292
19	Namen	224	54	278

(Source: State/Union Territory Tourism Department, Ministry of Tourism)

In the Tourists Centres of Assam, Guwahati has the highest Domestic and Foreign Tourists Inflow, followed by Tinsukia, Dibrugarh and Jorhat.

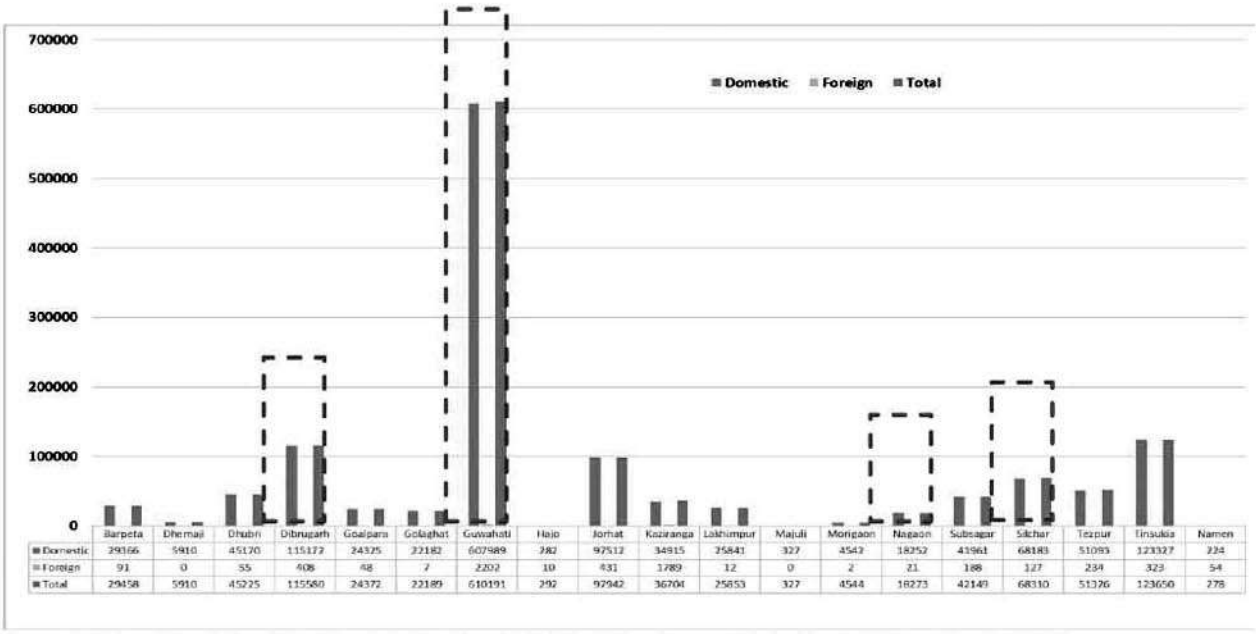


Figure 9-6 Tourists visits at the Tourists Centres/Districts of the Assam State (April 2005 – March 2006)

(Source: State/Union Territory Tourism Department, Ministry of Tourism)

9.4.1 Tourist flow as per Tourist Destination

Table 9-4 Tourist inflow as per tourist destination for year 2018-19

Sl No.	Name places	Domestic Tourist	Foreign Tourist
		2018-19	2018-19
1	Kaziranga N. Park	168738	7443
2	Pobitara N. Park	34606	605
3	Nameri N. Park	13847	1116
4	Orrang N. Park	8544	527
5	Dhekiakhowa bor Nambhar	397000	244
6	Majuli	8010	652
7	Bhalukpung (Tourist Lodge)	518	NIL
8	Manas N. Park	42329	658

9	Dibru Saikhowa N. Park	1793	24
10	Sivsagar Siva Doul, Rang Ghar, Kareng Ghar, Vishnu Doul etc.	395609	2835
11	Kamakhya Temple (Including Ambubachi Mela)	2253664	1544
12	Daul Gobinda	276247	12
13	Madan Kamdev	247649	16
14	Shankar Dev Kalakshetra	527590	346
15	Sri Surya Pahar (Sun Temple)	NA	NA
	Other	1650858	25187
	Total	**6027002**	**41209**

(Source: State/Union Territory Tourism Department, Ministry of Tourism,2018-19)

9.4.2 Tourism Policy of Assam – 2017

This tourism policy paper is aiming at creating a policy framework to move tourism into a major economic sector of Assam increasing the inflow of tourists' at least 2 to 3-fold in the next five years. Assam has special things to offer, but it needs to get the framework in place to realize the benefits.

Assam becomes a Nationally and Internationally acclaimed all-season Tourist destination for its unique wildlife, biodiversity and experience of an unexploited wonderland. Tourism is to be one of the main sources of income-generation for the people. It will also be a vibrant and significant contributor to the sustainable development of the State of Assam.

9.4.2.1 Objectives

- To make Assam a tourist Hub for North East India and to market Assam as a hot destination for the tourists from East & South East Asian Countries.
- To leverage innovative forms of Tourism such as Cruises, Ethnic Tourism, Tea& Golf, leisure Tourism, Transit Tourism, Adventure Tourism and Monsoon Tourism.
- To develop positive, Tourist friendly and reciprocatively culture among local tour operators, guides and hospitality providers and upgrade skill, quality and professionalism of all service providers connected with tourism.
- To develop tourism packages to cater to various types of tourists and market them through global and local tour operators and popularizing local and community hosts

to promote Bed and Breakfast, cottages on stilts accommodation across the Tourist spots/destinations.

- Developing Assam into an all-season tourist destination which focus on benefits for the Community and to create enabling environment for investment.

The main strategies of the tourism policy are:

- An interactive and comprehensive Assam tourism website was launched to provide all required information to all domestic and foreign tourist to know about the destinations and facilities and to promote the tourism by using social media.it should be properly maintained and updating of information should be created.
- Building a brand named "Awesome Assam" to develop tourism potential and to promote it at national and international level by advertising in TV, newspapers, magazines etc.
- Assam is a gateway to north eastern states. The state will play a proactive role to develop such a wide view of tourism promotion through coordination among the states in creating zonal and regional circuits.
- For each individual category of tourism such as Nature & Wildlife, Spiritual, Tea & Golf, Eco, Ethnic, Monsoon, Adventure etc. different Tourist destinations and tourist circuits shall be identified. Those should be categorised, and phase's wise planned development should be drawn up.
- Infrastructure facilities should be developed at tourist destination and to encourage public private partnership to provide amenities and local government should involve in the development of the amenities.
- Participation and the acceptance of local community is the key to make Tourism a success such that awareness programmes and entrepreneurship development programmes should be encouraged to develop local community. Tourism development at any destination should first benefit the local community in terms of economic and social gains.
- Skill development programmes are to be given to youth and women

9.5 Guwahati Tourism

Guwahati is blessed with an abundance of scenic grandeur. A wealth of rarest and near extinct species of wildlife, verdant forests, somber hills, undulating green hillocks and mighty water ways are main attractions. Moreover, the city is fortunate by surrounded 8 hill Reserve Forests and these corrugated green swathes provide the city its breathing space. The forests in and around Guwahati city area consisting large elephant population, good species of birds, primates, reptiles, langurs and leopards. The species of wildlife like the one horned Asiatic Rhino, the Golden Langur, the Pigmy Hog, the Hispid hare, the White winged wood duck, have made surrounding Wildlife Sanctuaries like Pobitora, Amchang and Kaziranga their home. Elephants, Bisons, Water Buffaloes, Hollock gibbons, several species of deer and thousand other varieties of wild-life and myriads of resident and migratory birds can be seen in the wildlife sanctuaries. Guwahati also witnesses number of wetlands and ponds in and around the city as leisure and eco-tourism. Believed as foundations of faith, the presence of ancient temples in the city remain mostly crowded by devotees and pilgrims and makes the spiritual tourism more vibrant. Hugging the shores of turbulent Brahmaputra, once a vast kingdom during the period of Mahabharata, is the largest city and a hub of the whole region. Guwahati has numerous tourist places. These places are given below are some of the important tourist places.

For many of the tourists, particularly for foreigners, Guwahati is not only a tourist destination but also is perceived as a halt or the entry-point to the north-eastern states. It is a city from where one could connect to other parts of Assam or get in and out of the northeast. On an average, a tourist spends about 2 days in transit which could be turned as a great opportunity to promote Guwahati City based Tourism.

Considering the present spots of tourism in Guwahati, there are

9.6 Tourism Destinations

Tourism sector is emerging as the largest service industry for generating employment and boosting economic growth, having forward and backward linkages. Guwahati has earned a name in the field of Tourism attracting tourists from both inside and outside India. The major tourism destinations are further divided in to six categories which are represented in map further,

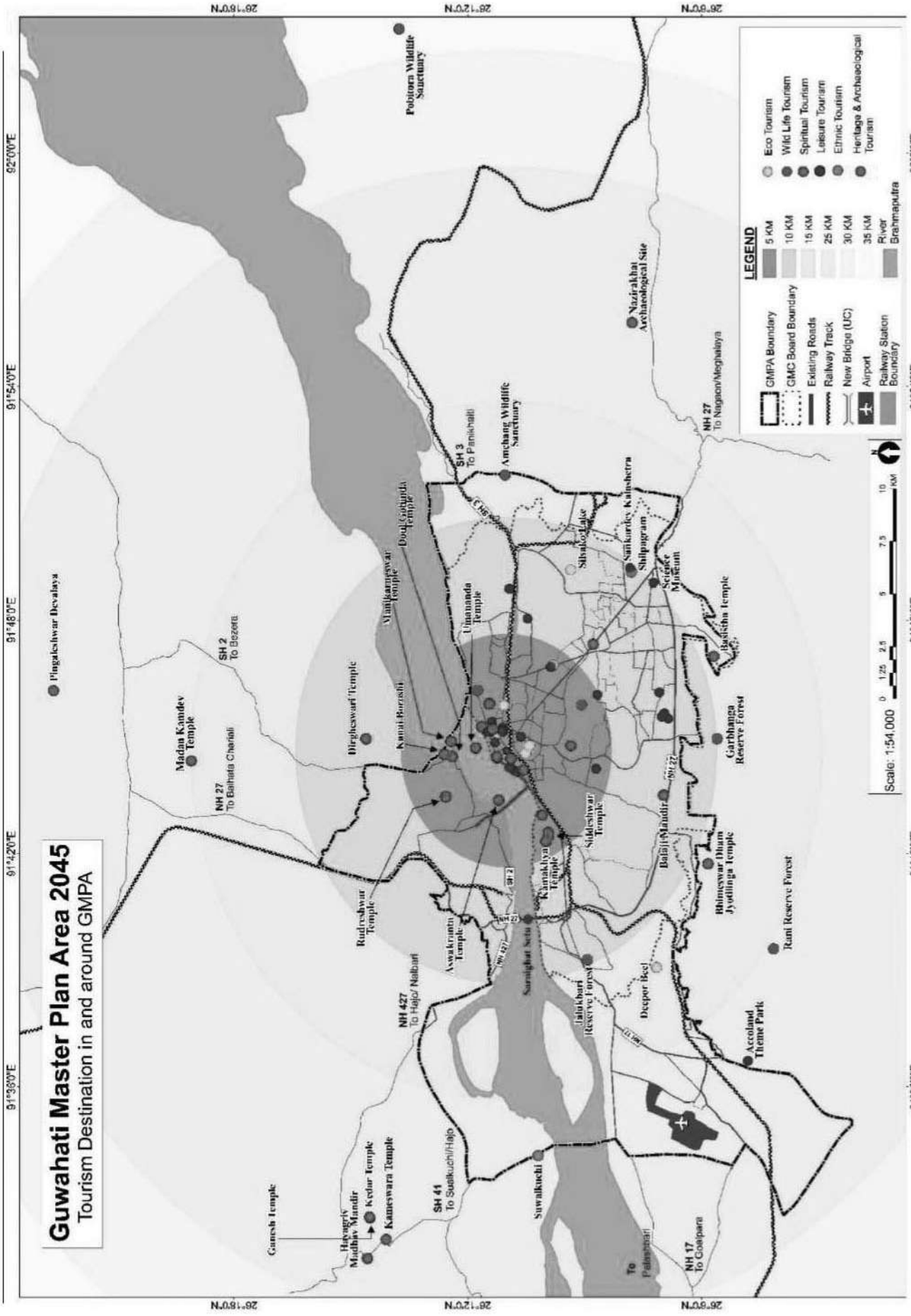


Figure 9-7 Tourism Destination Map, in and around Guwahati

9.6.1 Eco tourism

Eco-tourism is a concept, developed around the idea of travelling to places of natural beauty, moving around and staying with the places of nature for a couple of days. It has the twin objectives of conserving environment and improving the welfare of the local people. Assam has immense scope for eco-tourism. The state is virtually free from industrial pollution. Its green forests, blue hills, enchanting rivers are the basis on which eco-friendly tourism can be developed. The major spots of eco-tourism are,

9.6.1.1 Guwahati Zoo

Rhinoceros in Guwahati Zoo

The 175-hectare zoo is more of a city forest with 24 species of mammals, 40 species of spiders, 41 species of reptiles, 153 species of insects, 173 species of orchids. A sizeable number of these – the rare serow (wild goat), red jungle fowl and Chinese pangolin, for instance – roam the forest beyond the zoo area. One can encounter the free-ranging animals while exploring four forest paths – Spider Cave trail, Hillock trail, Jamun Swamp trail and Watchtower trail, the longest of them all.

9.6.1.2 Deepor Beel

The most important of the city's wetlands is Deepor Beel, the only Ramsar Site in Northeast India along with Loktak Lake in Manipur. The wetland, on the city's south-western fringe, has shrunk to 10.1 sq km from 41 sq km two decades ago, but it still serves as a natural stormwater reservoir for the city during the monsoon months. Only

Migratory Birds at Deepor Beel

a small part – 4.14 sq km – of the existing wetland has been declared a wildlife sanctuary. It is a source of livelihood for some 1,200 families in 14 indigenous villages along its periphery.

Ornithologists have recorded 219 species of aquatic birds including more than 70 migratory ones in the wetland, which attracts up to 19,000 birds a day during winter. They included the globally threatened spot-billed pelican, Baer's pochard, Pallas' sea eagle and Siberian crane. Surveys have also revealed 20 amphibian, 12 lizard, 18 snake and 6 turtle and tortoise species in the beel besides more 19 families. The beel sustains 18 genera of aquatic plants too, the giant water lily being the most prominent.

9.6.1.3 Dighali Pukhuri

The extent of Guwahati since the medieval Ahom area was virtually between manmade pukhuris or ponds/tanks aligned almost parallel to the Brahmaputra. The oldest of these water bodies is the rectangular Dighalipukhuri meaning 'long pond'. Originally, half a mile in length, this tank is said to be as old as the epic Mahabharata.

Presently, this prime pond is the best recreational space enjoyed by city dwellers around the core city area. Recently, the war memorial park was inaugurated on the northern end of pukhuri which showcases earlier freedom struggles and scrifices.

9.6.1.4 Silpukhuri

Silpukhuri or the pond of stones is on the eastern end of this 'axis of ponds'. It derives its name from a stone plaque on its edge which says Tarun Duwara Barphukan dug the pond in 1753. Historians say there were four cannons beside this

plaque. Two are now kept in the Assam State Museum and two placed in front of Nabin Bordoloi Hall. According to historian Surya Kumar Bhuyan, Silpukhuri got its present name in the early part of the 20th century.

9.6.1.5 Borsola - Sarusola Beel

Guwahati's concrete growth condensed and divided the Cholabeel of yore into the Borsolabeel and Sorusolabeel, both a fraction of the original wetland's size. The encroachment of this and other beels – Deepor Beel Wildlife sanctuary and Bobeel or Silsako Beel – 'leading to the problem of artificial floods' was responsible for thre Guwahati Waterbodies (Preservation and Conservation) Act of 2008. These centrally located wetland are consisting huge scope for preservation and development as recreational spaces.

9.6.1.6 Chandubi Lake

A natural lagoon forming a nice picnic spot, with the surroundings broken by cliffs and forests forming an ideal holiday resort. There are added attractions of fishing and rowing opportunities in the lake itself. Located around 65km from Guwahati (about an hour and a half), near the Meghalaya border, Chandubi is a very scenic and picturesque lake in the lap of the nature. The local authorities have developed the area as a picnic spot and for day-trips, as well as overnight stays.

9.6.2 Spiritual Tourism

Guwahati is known for its' Spiritual tourism, the old scriptures describes the Guwahati as Panch-Teerth or a five pilgrimage place. When it comes to spirituality, Guwahati itself is a place owes several pilgrimage destinations which have historic significant. It is major hub in eastern Indian state of Assam which has varieties of different religions and culture that flourished in its lap over the passage of time. Many temples and monuments are built in Guwahati which reflect different traditions and religious beliefs.

The present day Guwahati is well known for the temple of Kamakhya, the early medieval sites like Pandunath, Vishnu-Janardhan in the southern bank; Umananda and Urvashi Islands in middle of the river and Dirgheswari, Daul Govinda, Kurma-Janardan, Aswaklanta, Rudreswar and Manikarneswar in the northern bank of Brahmaputra river. The famous archaeological site of Ambari in Guwahati has provided ample evidence for understanding the cultural growth of the area since the beginning of Common Era.Guwahati is important as a place of pilgrimage, wrote WW Hunter in his A Statistical Account of Assam (1879). The importance has increased manifold after more than 130 years. Kamakhya takes the top spot followed by Ashwakranta (in North Guwahati), Umananda, Sukreswar and Basistha Ashram.

9.6.2.1 Kamakhya Temple

The shakti temple of mother Goddess Kamakhya is situated on the top of the Nilachal Hills at a distance of about 10 kms from Guwahati railway station, is an important religious tourism destination in the state. There is the shrine of Tantrik Shaktism of Samudragupta's period. On an average, it attracts about 500 visitors every day. The Ambibashi mela held in the temple or four days in the month of June attracts thousands of pilgrims every year. Kamakhya is also recognised as an important holy place in Buddhist tantric circles. There are several small temples surrounding the main temple which are dedicated to many deities and are collectively called the Dasa mahavidya.

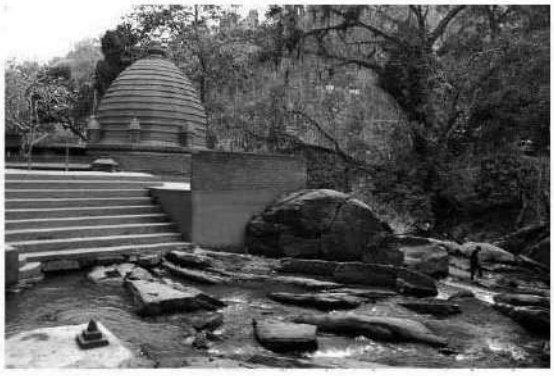
9.6.2.2 Navagraha Temple

Navagraha, which means the temple of nine planets atop Chitrachal Hill is one of only two on earth. An ancient seat of study of astronomy and astrology, this temple in its present form was built by Ahom king Rajeswar Simha in 1752. The sanctum sanctorum has a stone imprint of the solar system besides nine lingas representing the nine planets. It is 12 kms from Guwahati.

9.6.2.3 Ashwakranta Temple

Also called Ashwaklanta (meaning 'where tired horses rested'), this temple is said to be as sacred as Gaya in Bihar for performing last rites. The temple houses a sacred stone said to bear the footprints of Lord Vishnu in his avatar as a tortoise. It also has an idol of Vishnu in eternal sleep. Another school of thought says the marks were left behind by Lord Krishna's horses while resting during a bitter war with Kamarupa ruler Naraka. This temple atop a hillock attracts many pilgrims during Doul Utsav (March) and Ashokashtami.

9.6.2.4 Basistha Ashram



This ashram on the south-eastern part of the city dates back to the Vedic age. It is where sage Vashishtha was believed to have regained his physical form after the removal of a curse through rigorous penance. Ahom king Rajeswar Simha in 1764 built a Shiva temple beside the ashram by a stream formed by three mythical rivulets – Sandhya, Lalita and Kanta. The stream flows through the city as Bharalu river befor meeting river Brahmaputra.

9.6.2.5 Manikarneswar

This unique star-shaped Shiva temple on a hillock at Rajaduar is one of the oldest built by the Pala dynasty in the 11th century. It was rebuilt by Rajeswar Simha in 1755. A 100 steps lead to this temple complex with a pleasant ambience.

9.6.2.6 Dirgheswari Devalaya

Perched on a rocky hill, this is an ancient temple of Goddess Durga. It was rebuilt by Ahom king Rajeswar Simha in the 18th century. There are many images of Hindu deities engraved on the rocks around.

9.6.2.7 Rudreswar Devalaya

Built by Ahom king Pramatta Simha in the 18th century in honour of his father Rudra Simha, this temple is located near Manikarneswar on the site where Rudra Simha was cremated.

9.6.2.8 Umananda Temple

This temple is situated on the Peacock Island According to Kalika Purana and Yogini Tantra, the island was called Bhasmachal or Bhasmakut, where Lord Shiva was believed to have reduced Kamadeva into ashes for interrupting his meditation. Ahom king Gadadhar Simha had the Shiva Temple built on this island – considered the smallest in the world with a human habitation – in 1694. The island is a major attraction during Shivaratri.

8.1.2.4 Dihing Satra


Dihing Satra Manuscript

During the days of invasion of main warrior & rebellion of Marans, King Purnananda Buragohain most likely established this Satra with six satradhikar. Out of twelve Satras of Assam, this satra is a specific one. In every year, devotes of Majuli's Aauniati Satra perform 'Ankia Nat' & 'Palnam' in this Satra of North Guwahati. Dihing Satra has two divisions named 'Sarujana' & 'Barjana'. These are situated in North Bank of river Brahmaputra.During the days of invasion of main warrior & rebellion of Marans, King Purnananda Buragohain most established this Satra with six satradhika.

9.6.2.9 Doul Govinda

The temple is Situated at Rajaduar at North Guwahati, this temple is dedicated to Lord Krishna. The temple was built 150 years ago around a deity brought from Nalbari but was renovated in 1966. The temple derives its name from Doul or Holi celebrated in March. The temple can be reached from Guwahati by a boat and ropeway aswell across the Brahmaputra.

9.6.2.10 Balaji Temple

Purva Tirupati Sri Balaji Mandir, located in NH-37 Betkuchi, Guwahati was constructed on the Land given by Govt. of Assam by the Devotees of Mutt, M/s Williamson Magor and group of companies. The consecration (Pran Pratistha) was done in the year 1998 in benign presence of Their Holinesses Sri Jayendra Saraswati Swamigal and Sri Sankara Vijeyendra Saraswati, Sankaracharya of Kanchi Kamakoti Peetam, Kanchipuram. The temple has a clean environment.

Tirupati Balaji Temple Guwahati is a profound and peaceful place for the devotees to visit. It is a magnificent temple of the city Guwahati, Assam India. The main temple has an idol which weighs about 4 tonnes and is dedicated to Lord Balaji.

9.6.2.11 Chakreshwar Temple

Chakreshwar Temple is a famous Lord Vishnu temple in Guwahati city. The temple's specialty is Lord Vishnu's Chakra (weapon) impression naturally embossed on a large rock. At the entrance of this temple you can see the sculptor of Lord Krishna driving the chariot. The temple is nicely decorated with beautiful engravings on the wall. It is one of the best ancient temples of Guwahati. The main temple of Chakreshwar has a large rock which has an impression of Lord Vishnu's Chakra (weapon) impression on it. According to the mythology when Lord Vishnu dismembered Sati's lifeless body his Sudarshana Chakra had struck this rock.There is a vertical pillar surface that serves to indicate the height reached by the Brahmaputra river during floods.The statue of resting Lord Vishnu and Goddess Lakshmi is sculpted on the scale.

9.6.2.12 Shukrashwar Devalaya

Ahom king Rajeswar Simha established this Shiva temple on a hillock by the Brahmaputra in the 18th century. This temple later was constructed in the year 1744 by the King of Ahom, Pramatta Singh, who is supposed to have constructed many religious sites during his rule. According to ancient Kamarupa history, the hillock where the temple stands was called Hastiparbat. The temple and the adjoining Barphukanar Tila was part of the erstwhile Itakhuli fort of the Ahom rulers. The history of the temple is associated with Saint Sukra, who made a retreat at the Sukreswar hillock, where he regularly meditated and worshipped Lord Shiva. The place where he meditated is called Hastagiri as per the Kalika Purana, for it being in the shape of the hump of an elephant. The bank of the

river on where the temple is located is used by the devotees for taking holy bath and performing other Puja activities. The temple too has beautifully designed steps which lead to the holy river and make the journey to the river an amazing experience. Besides that, the scenic beauty of the rising sun visible from the bank of the river makes the place more beautiful.

9.6.2.13 Ugratara Temple

Situated beside Jorpukhuri in Uzanbazar, this temple is where the celestial Sati's eyes are believed to have fallen. Ahom king Siva Simha had this temple built in 1725. Ugratara Temple is one of the seven Shakti peethas described in Kalika Purana. It is believed that this is the spot where the novel of Goddess Sati fell after Shiva danced with her corpse. According to Kalika Purana, there are seven Shakti peethas which are mainly concentrated on and around Kamakhya Temple. ThUgratara temple is dedicated to this form of Dikkara Vasini.

9.6.2.14 Christ Church

Constructed at Church Field in 1844 and destroyed by powerful earthquakes in 1854 and 1897, Christ Church met the British administrators' need for a place of worship. Reverend A and Reverend Robert James Bland, appointed chaplain of Assam, gave it a shape. The church has crenellated engaged bastions, arched windows and pointed finials typical of neo-Gothic architecture in Europe. This direct transposition of European stylistic features to buildings in the sub-continent is a theme seen in many examples of colonial British architecture in India.

Christ Church

9.6.2.15 Dargah

The dargah of Pir Hazrat Zahir Auliya Khwajagan from Ajmer Sharif on the banks of river Bharalu in Ulubari area is more than a century old. A pilgrimage for both Hindus and Muslims, the dargah attracts thousands of devotees during the annual Urs in February. The city's Sijubari area has another popular dargah dedicated to Makhdumsah.

9.6.2.16 Bura Masjid

Purana Guwahati Nagarar Varnana, one of the oldest accounts of the city published in 1885, mentions three mosques at Solabeel, Machhkhowa and Lakhtokia areas. Bura Masjid, the one at Solabeel, is the oldest. It was built by some soldiers during the Mughal occupation of the city from 1665-1667, evident from the grave of one of Emperor Aurangzeb's army commandants within the mosque complex. The mosque was rebuilt in the 1850s at the present site at Ambari but Muslim residents of Lakhtokia and Machkhowa built their own mosques as Bura Masjid was 'too far'. The mosque regained prominence as the city expanded, and it transformed into an imposing concrete structure in the 1980s.

9.6.2.17 Gurudwara Sri Guru Singh Sabha

Gurudwara Shri Guru Singh Sabha

Sardar Alla Singh one of the first station master of Guwahati Railway Station, felt spiritually starved as the city had no gurdwara. He formed a gurdwara committee in 1902. Three years later, the committee purchased a plot of land at the Lakhtokia-Kamarpatty junction and had the tin-roofed single storey Sikh Temple built. By 1926, a concrete structure replaced the old Gurudwara which have turned into five story building in 1974. The gurdwara is supervised by Shri Guru Singh Sabha, which also runs the Guru Nanak School in Sharab-bhati area. The five story building have diveded into various section, like 1st two stories rented out for commercial use, then 3rd floor serves Langer ghar and guest house and then 5th floor is adorne with Kalash which is made of pure gold and the name of contributer is engraved on it.

9.6.3 Wildlife Tourism

An attractive feature of the Assam's forests is its colorful wildlife. Some of the species are exclusive to the state. Assam is famous as the home of one-horned rhinoceros which is its unique selling point apart from the fauna.

Though most of the domestic and international tourists are drawn towards Kaziranga and this heritage site has got best tourist facilities with private participation, yet the Government will develop infrastructure around individual Wildlife sanctuaries such as Manas, Pabitora, Orang, Pani Dihing, Barail and Nameri at Dibru-Saikhowa across Assam to accommodate tourists and resort to aggressive marketing to position Assam as Wildlife destination of the world. The Quality of Tourist facilities will be improved and proper tourist information centers will be established in each place.

Hills, forests and wetlands are vital cogs in the city's ecosystem wheel. The total forest cover in the city hills now is 13.60% primarily due to felling and encroachment. Of the 7,023 hectares of hill land, 2,642 hectares fall under Reserve Forests (RF). According to the 2007 statistical report of the state, 1,640 hectares of the city's RFs are under encroachment and there are 75 villages in the hills, consisting of 26,985 households.

But, whatever the condition they are in today, these corrugated green swathes provide the city its breathing space. Following are some spaces of other wild areas in and around Guwahati.

9.6.3.1 Pobitora Wildlife Sanctuary

It is one of the major wildlife sanctuaries of Assam, situated in the Morigaon district. It is around 50 km from Guwahati covering an area of 15.9 sq. km. It is famous for its great Indian One Horned Rhinoceros. Other animals like Asiatic Buffalo, Leopard, Wild Bear, Civet Cat etc. along with more than 200 various birds and reptiles.

9.6.3.2 Reserved Forests in and around Guwahati

Amchang Reserved Forest: on the eastern edge of the city is the 78.64 sq km Amchang Wildlife Sanctuary. It is home to many species of mammals, birds and reptiles. The most notable are elephant, leopard, leopard cat, jungle cat, hoolock gibbon, capped langur, flying fox, barking deer, lesser and greater adjutant stork, white backed vulture, green imperial pigeon and lesser pied hornbill.

Amchang WLS has had encroachment issues as have other wooded areas and 19 hills in and around the city. The outcome was the Assam Hill Land and Ecological Sites (Protection and Management) Act of 2006, which blames destruction of hill land for heavy erosion, landslides and soil movement with rainwater. Landslides on the Guwahati hills claimed more than 100 lives between 2001 and 2011.

1. **Garbhanga RF:** Richest patch contiguous to forests of Meghalaya
2. **Rani RF:** Reasonably good patch with a large elephant population, primates and birds **South Amchang RF**: Partly degraded, good for general natural history
3. **Khanapara RF:** Degraded and encroached, has some birds
4. **Fatasil RF:** Degraded, has a leopard population
5. **Sarania RF:** Tiny hillock with some birds and reptiles
6. **South Kalapahar RF:** Small degraded patch
7. **Jalukbari RF:** Secondary Forest and plantation
8. **Hengerabari RF:** Degraded, connected to the zoo
9. **Chunsali and Ramsa Hill:** Degraded, had capped langurs until a few years ago
10. **Nilachal (Kamakhya) Hill:** Degraded but relatively intact in places, has leopards and reptiles
11. **Narakasur (Birubari) Hill:** Degraded but relatively intact at places, good for reptiles

9.6.4 Ethnic Tourism

Assam has been a unique place in india for the cultural and ethnic diversities. The state is a homeland of various ethnic tribes and groups, each having its own cultural heritage. Each of these tribes possesses some unique features in its socio-cultural life including customs, religious belief, language, culture, dress, way of life, festivals, food habits, songs and dances which are diff erent from others.

Ethnic Tourist circuits are developed to attract the tourists from all over the world. The ethnic socio-cultural and religious festivals will be organized where Songs and dances, display of colourful dresses, tasting of innumerable varieties of both vegetarian and non-vegetarian dishes is the main feature.

Foreign tourists in India are driven by the desire to see something different where curiosity is the ultimate factor. The travelers choose to experience firsthand practices of another culture, and may involve performances, presentations and attractions portraying or presented by indigenous communities. In a broader perspective, it includes cultural, heritage, anthropological, tribal, village and similar forms of tourism. Ethnic tourism, will be properly planned, managed and promoted as sustainable form of tourism and also utilized as a tool for the preservation and conservation of culture and heritage as well as for poverty alleviation.

9.6.4.1 Sualkuchi

Sualkuchi is endearingly referred to as the Manchester of the East. Situated on the northern banks of the Brahmaputra, it is famous for its centuries-old heritage of weaving. The golden fields of ripe paddy on both sides of the road, cattle grazing leisurely among the small hillocks and plains, and several naamghars (community prayer halls) with exquisitely designed entrances. Around 25 km north-west of the Guwahati is Sualkuchi, famous for village that produces all three world-famous Assam expansive indigenous silks – silvery pat, golden muga and the warm-as-wool eri –silks – paat, muga and eri. Sualkuchi attracts visitors keen on carrying home exquisite silk fabrics.

9.6.4.2 Hajo

Hajo, 35km to the northwest, presents a picture of communal harmony. Here, Hinduism, Islam and Buddhism have remained inseparable from one another for centuries. The Hayagriva-Madhava temple, a 6th century structure rebuilt in the 16th century, doubles as a Buddhist shrine for pilgrims from Bhutan, Ladakh, Tibet and south-western China. Some say Buddha attained nirvana here. Close by is the 17th century PoaMecca shrine that is believed to ensure one-fourth the salvation of a Haj pilgrimage. Every February, local Muslims lead the procession when the Brahma, Vishnu and Maheswar idols of Hayagriva-Madhava temple are taken out on an annual round of Hajo town. A cluster of other temples – dedicated to Kedareswar, Kameswar, Kamaleswar, JoyDurga, Ganesh and other gods and goddesses, as also the Dhoparguri satra – are enough to keep one busy for the entire day in Hajo. Powa – Mecca Side by side with the Madhav Temple there is a celebrated Muslim shrine at Hajo -Powa-Mecca.

9.6.4.3 Shilpgram

The only crafts village of the North East Zone Cultural Centre in Guwahati set up in year 2006 at Panjabari. Shilpagram organises crafts fairs for artisans across the Northeast and provides space at a nominal cost. It has an open-air stage and an auditorium for cultural events throughout the year. Every year the Shilpgram Mahotsav has cultural programmes, exhibition-cum-sales of crafts and traditional cuisine marking its foundation day. The North East Zone Cultural Centre (NEZCC), under the Union Ministry of Culture, is being hold at Shilpgram Mahotsav on the Shilpgram premises